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Environmental Assessment

Community Tank Grassland Restoration Project

**Williams Ranger District, Kaibab National Forest
Coconino County, Arizona**

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Table of Contents

Chapter 1 – Purpose and Need.....	1
Background.....	1
Current Condition.....	1
Desired Condition.....	2
Purpose and Need for Action.....	2
Objectives.....	3
Proposed Action.....	3
Forest Plan Consistency and Direction.....	4
Decision Framework.....	4
Compliance with Applicable Laws.....	4
Public Involvement.....	5
Tribal Consultation.....	5
Issues Raised During Scoping.....	6
Chapter 2 – Alternatives.....	8
Alternative Considered but not Analyzed in Detail.....	8
Alternative 1 - No Action.....	8
Alternative 2 – Proposed Action.....	9
Vegative Treatments.....	9
Prescribed Burning.....	10
Road System.....	11
Fence Modifications and Removals.....	12
Re-designation of Land Suitability.....	12
Mitigation Measures for the Proposed Action Alternative.....	13
Monitoring of Proposed Action Alternative.....	14
Comparison of Alternatives.....	15
Chapter 3 – Environmental Consequences.....	19
Overstory Vegetation.....	19
Wildlife.....	27
Soils and Watershed.....	38
Rare Plants.....	40
Noxious and Invasive Weeds.....	43
Rangeland Vegetation and Range Management.....	45
Fire and Fuels.....	46
Air Quality.....	48
Heritage Resources.....	50
Scenic Resources.....	51
Recreation Opportunity.....	52
Economics.....	54
Environmental Justice.....	55
Climate Change.....	56
Chapter 4 – Consultation, Coordination, Appendices, and Literature Reference.....	57
Interdisciplinary Team Members.....	57
Federal, State and Local Agencies Coordination.....	57
Tribal Organizations Consulted.....	57

Business and Special Interest Groups.....	57
Appendix A: BMPs to the Proposed Action Alternative.....	58
Appendix B: Literature References.....	60
Appendix C: Response to Comments.....	62

List of Figures

Figure 1 – Project Vicinity Map.....	1
Figure 2 – Proposed Action: Vegetative Treatment, Prescribed Burn, and 300 Foot Buffer Areas.....	11
Figure 3 – Proposed Action: Roads and Fences.....	12
Figure 4 – Pile and Burn Area and Suitability Redesignation Area.....	13
Figure 5 – Histogram of Current VSS within EMA.....	21
Figure 6 – Northern Goshawk Habitat Structure, 3 Scales Map.....	22
Figure 7 – Old Growth, 3 Scales Map.....	26
Figure 8 – Community Tank project area, Mexican spotted owl (MSO) habitat, and goshawk management areas.....	31

List of Tables

Table 1 – Three Issues that were Potentially Significant.....	6
Table 2 – Non-significant Issues Identified.....	6
Table 3 – Summary of Effects for the Community Tank Project Area.....	15
Table 4 – Scales of Analysis Attributes and Measurements Table.....	24
Table 5 – Acres of Vegetation Cover Types on Forest Service lands within the Community Tank Project Area, Williams RD, and Kaibab NF. Data source is the Kaibab NF existing vegetation GIS layer.....	28
Table 6 – USDA Forest Service Southwestern Region List of Sensitive Plants that May Occur on or Near the Community Tank Grassland Restoration Project Area.....	37
Table 7 – NatureServe Explorer Species Survival Ranking, January 15, 2009.....	41

Chapter 1 – Purpose and Need

Background

The Williams Ranger District is proposing to implement a grassland restoration project designed to improve habitat for pronghorn antelope and other wildlife species associated with grasslands and pine savanna, and create a vegetation structure that is more resilient to disturbance, with a reduced risk of high-severity crown fire over time. The project area encompasses approximately 1,600 acres and is located in the northeastern portion of the district west of Kendrick Mountain and just south of Moritz Ridge. It is in T23N, R4E, Sections 1, 2, 3, 10, and 11; T23N, R5E, Section 7; and T24N R4E, Section 34 (See Figure 1, Project Vicinity Map). The project area is in Geographic Area 2 (May, 2008; previously Ecosystem Management Area 2), the Beale Ecosystem Management Area identified in the Forest Plan, Arizona Game and Fish Department's Game Management Unit 7W, and includes portions of the Government Mountain and Moritz Lake grazing allotments.

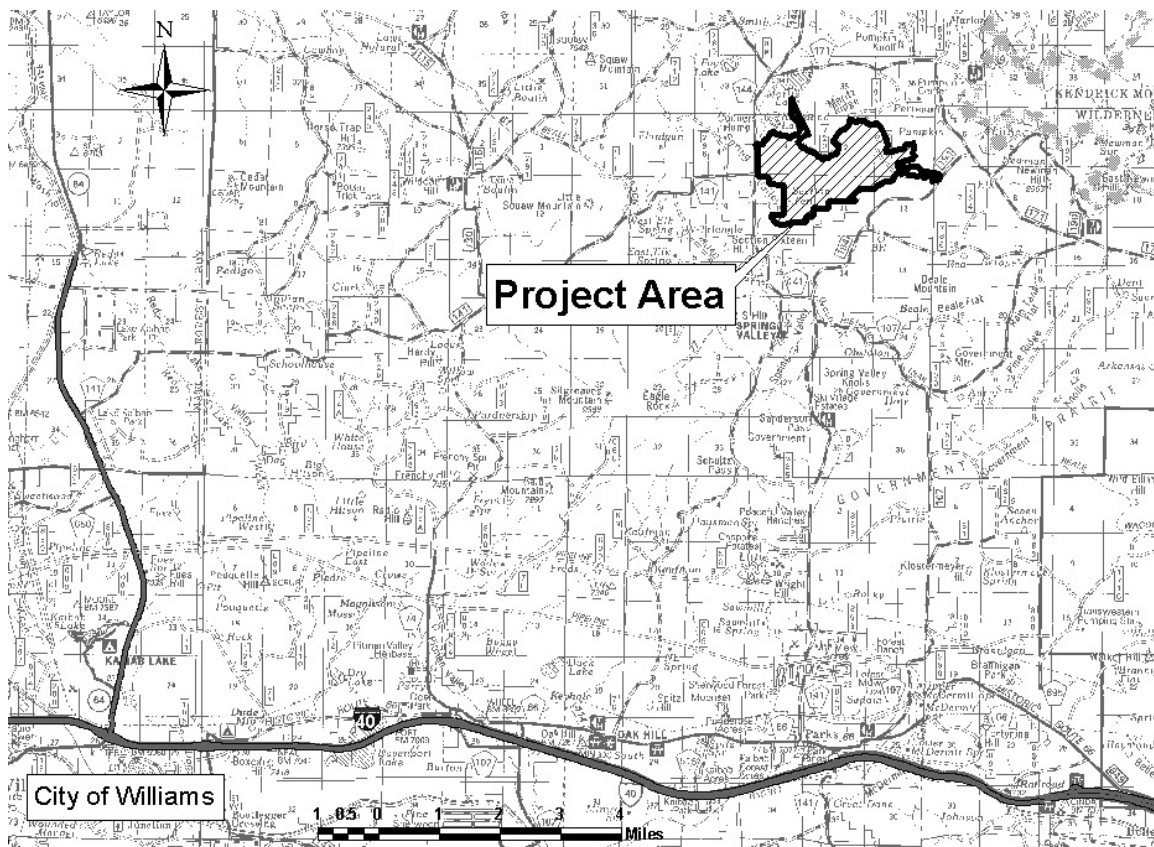


Figure 1. Project Vicinity Map.

Current Condition

The Community Tank area is mostly flat bottomlands; ridges and gently raised uplands surround these bottoms. Currently the project area is dominated by ponderosa pine with some alligator juniper and pinyon pine mixed in. Tree numbers average 68 trees per acre, ranging from 16 to 163. Diameters average 12 to 18 inches, and ages average between 60 and 80 years. Some “yellow pines” are present, widely scattered on basalt outcrops. Most of the trees have become established in the past 120 years as a result of livestock grazing and fire suppression.

The understory is dominated by blue grama grass with a low to moderate density of grasses and forbs. There are scattered shrubs including wax currant, ceanothus, and wild rose. Openings within the trees have higher grass densities. Meadow-like conditions currently exist on approximately 300 acres (20%) of the project area. Over time, tree encroachment into the remaining meadows will reduce their size and further suppress grass, forb, and shrub development.

Radio telemetry data collected by Arizona Game and Fish Department in the 1990s showed that pronghorns traveled through the Community Tank area on their migration between summer range near Bellemont and A-1 Mountain and winter range near Red Butte to the north. Pronghorn are frequently seen in the grassland area around Moritz Lake just north and west of the project area.

There is a goshawk territory located on the southeast side of the project area. A small area (24 acres) designated as goshawk Post-fledgling Family Area (PFA) overlaps the southern boundary of the Community Tank project area. The goshawk is classified as Sensitive by the Southwest Region of the Forest Service. The Mexican spotted owl, which is listed as Threatened under the Endangered Species Act, is not known to occur in the proposed project area, and the project area contains no Restricted, Protected, or designated spotted owl Critical Habitat.

There is a 4-strand barbed wire fence around the project area without any pronghorn passage modifications. There are also fenced enclosures around Community Tank and Section Ten Tank. Because pronghorn do not generally jump over fences, these fences may impede pronghorn movement and restrict access to water. In the northwest portion of the project area, there is one mile of barbed wire fence that is falling down and is not needed.

The project area has a Recreation Opportunity Spectrum class of “Rural” and “Roaded Natural.” The Scenic Integrity Objective is “Level II – High,” indicating that the landscape character appears unaltered. There are 11.2 miles of forest roads within or immediately adjacent to the project area. This includes 10.2 miles of Forest Service roads and 1.0 mile of private road. Roads can increase the potential for disturbance to wildlife by making the area more accessible and increasing the potential for encounters with humans.

The western and southern boundaries of the project area border private property with homes and other structures. The potential for high intensity wildfire in this area is currently low, but as the forest becomes denser and tree canopies close, it would steadily increase over time. Below Moritz Ridge, there are high live and dead fuel loads that contribute to a greater potential for high-intensity wildfire.

Desired Condition

The desired conditions for the Community Tank area include more open vegetation structures that 1) provide wildlife habitat characteristics that are more similar to the grassland and pine savanna habitat conditions that occurred in the project area historically, and 2) are resilient to disturbance and not prone to high-severity crown fire.

Purpose and Need for Action

Canopy openings and meadows are key habitat for many organisms in ponderosa pine forest, but these habitats have been severely reduced during the 1900s by invasion of post settlement trees (Moore and Huffman 2004). Historic maps and vegetative evidence show that over the last century much of the project area has transitioned from grassland and open pine savanna to a ponderosa pine forest. Moore et al. (1999) suggest much of the species diversity in ponderosa pine forest is contained in understory

vegetation, which also provides forage for herbivores. The quality of grassland habitat in the Community Tank area is reduced by current tree density. Removing trees and conducting prescribed burning would improve grass, forbs, and shrub production; and generally improve habitat conditions for species associated with grasslands. Maintaining open stands is consistent both with ecosystem-based (rather than single species) management and the evolutionary environments many species encountered in historical ponderosa pine forest (Moore et al. 1999).

The private property adjacent to the project area meets the Forest Service Southwestern Region definition for wildland-urban interface. Tree removal and prescribed burning in the wildland-urban interface area would reduce the live and dead fuel loading, thereby reducing the fire potential.

The purpose and need is to reduce tree densities and fuel loads in the project area to:

- Improve habitat for pronghorn antelope and other wildlife species associated with grasslands and pine savanna;
- Create a more open vegetation structure that is more resilient to disturbance, with a reduced risk of high-severity crown fire over time.

This action responds to the goals and objectives outlined in the Kaibab National Forest Plan (USDA 2004), and the Greater Williams Area Community Wildfire Protection Plan (Coconino County and City of Williams 2005).

Objectives

- Increase the potential sight distance of pronghorn by reducing tree densities to less than 10 trees per acre while maintaining safe fence crossings.
- Increase grassland habitat quality, diversity, and herbaceous cover of desirable native herbaceous and shrub species by at least 10% over the next 10 years.
- Reduce vehicle encounters and associated disturbance to wildlife on approximately 2.2 miles of roads within the project area.
- Maintain a low risk for high intensity wildfire in the wildland-urban interface by reducing the live and dead fuel load by at least 30% over the next 10 years.

Proposed Action

The Forest Service proposes to implement the following actions to meet the purpose and need. This project proposal is made up of four separate activities designed to restore grassland conditions and improve pronghorn habitat in the Community Tank area.

- Restore grassland condition in areas that historically were meadow or meadow like ponderosa pine savanna (see Figure 2, Treatment Map).
- Prescribe burn approximately 1,400 acres, with reentry burning in subsequent years to maintain grassland conditions (see Figure 2, Treatment Map).
- Remove approximately one mile of fence and modify one and a half miles of fence to facilitate pronghorn movement. (See Figure 3, Proposed Action Map)
- Obliterate 2.2 miles of roads. (See Figure 3, Proposed Action Map)

More information about the Proposed Action and No Action alternatives considered is presented in Chapter 2.

Forest Plan Consistency and Direction

Relevant management direction in the Kaibab National Forest Plan (p. 18-20) and proposed action consistency:

- “Improve wildlife habitats through...development of habitat quality and diversity, and the identification and protection of key habitats.” The improvement of wildlife habitat would be achieved by the proposed action and analyzed in Chapter 3, Wildlife section.
- “Cooperate with the Arizona Game and Fish Department to achieve management goals and objectives specified in the Arizona Wildlife and Fisheries Comprehensive Plan and support the Arizona Game and Fish Department in meeting its objectives for the state.” Arizona Game and Fish Department have been involved with this project and support the restoration activities around the community tank area for pronghorn benefits.
- “Produce the maximum amount of forage, consistent with other resource values, for use by wildlife and livestock on a sustained yield basis.” The proposed action would maximize forage in the community tank area and benefit resource values, analyzed in the Chapter 3 Range and Wildlife section.
- “Use prescribed fire...as a resource management tool where it can effectively accomplish resource objectives.” Mitigation measures would be in place for the proposed action to successfully accomplish resource benefits with prescribed fire, effects are analyzed in Chapter 3 Fuels section.
- “Maintain soil productivity and watershed condition.” Soil productivity and watershed condition would be maintained with the proposed action, analyzed in the Chapter 3 Soils and Watershed section.
- “Manage a serviceable road transportation system that meets needs for public access, land management, resource protection, and user safety. Provisions are made for...obliteration of unnecessary roads.” The Proposed Action for road obliteration is consistent with the Williams Ranger District travel management direction and is identified as unnecessary roads.
- More forest plan consistency is stated throughout the environmental assessment.

Decision Framework

The Forest Supervisor will decide:

- Whether or not to implement the Proposed Action as proposed or as modified within the scope of the analysis.
- Whether or not the project may result in significant effects
- What parameters and management practices apply
- What level to conduct tree felling, prescribed burning, fence removal, and road obliteration within the Community Tank project area

Compliance with Applicable Laws

- National Forest Management Act of 1976: The Forest Plan contains, guidance for the design of vegetation treatments to improve habitats for management indicator species (MIS), including provisions for diversity, old-growth, habitat components (i.e. snags and logs), and a range of vegetation succession stages. The Wildlife Specialist Report and Chapter 3 evaluate the effects to MIS in light of current research, habitat availability, and existing population data.
- National Environmental Policy Act of 1969: The Community Tank Grassland Restoration Project was prepared in compliance with NEPA.

- Federal Water Pollution Control Act 1977 (Clean Water Act): Through the use of best management practices, Alternative 2 would be met as there are no affected flood plans or wetlands within the project area.
- The Endangered Species Act of 1973 as amended: The project is in compliance of section seven under the endangered species act.
- Migratory Bird Treaty Act: This project is consistent with direction in the Migratory Bird Treaty Act and Executive Order 13186, and potential effects to migratory birds' populations are evaluated in the Wildlife Section of Chapter 3 and Wildlife Specialist Report.
- National Historic Preservation Act of 1966, as amended: Section 106 requirements for survey and evaluation have been met for all undertakings listed under this proposed action.
- Clean Air Act of 1970 as amended: Burning would be done only after receiving approval from the Arizona Department of Environmental Quality (ADEQ) that burning can proceed (see, Chapter 3, Air Quality section).

Public Involvement

This project has been listed in the Schedule of Proposed Actions since April 2002. The proposal was mailed out for scoping to landowners in the area, interested public, and other agencies on July 9, 2003. An article requesting comment on the proposed action was published in the Williams-Grand Canyon News on July 30, 2003.

The proposed action and EA was made available for public comment in July of 2006. The legal notice that began the 30 day comment period was published on July 30, 2006 in the Arizona Daily Sun. Due to the length of time since the 2006 comment period and additional analysis, the EA was sent out for public comment again in 2009. The legal notice that began the second 30 day comment period was published on June 29, 2009 in the Arizona Daily Sun. The comments provided to the Forest Service during these comment periods were considered in this assessment and the Forest Service's response is provided in Appendix C.

Following conversations with some of the concerned land owners, a meeting was held to allow them to express their concerns for further discussion and involvement in the decision making process. Phone conversations with additional land owners also occurred to help address their concerns and answer questions. The meeting and conversations helped explain the delays in the process and provided for meaningful discussions about the project.

There was also coordination with the Arizona Game and Fish Department and consultation with American Indian tribes.

Tribal Consultation

On January 22, 2003 the Kaibab National Forest, Kaibab Tribal Liaison Michael Lyndon, initiated government to government consultation with the Hopi Tribe for the Community Tank Grassland Restoration Project during a consultation meeting in Kykotsmovi, Arizona. Tribal representatives received a copy of the heritage resource clearance for the project and stated that the Hopi Tribe had no concerns regarding the proposed project.

The Community Tank Grassland Restoration Project was added to the Kaibab National Forest Schedule of Proposed Actions (SOPA) during the Third Quarter of Fiscal Year 2003. On April 22, 2003 the Kaibab National Forest Supervisor initiated government to government consultation for the Community

Tank Grassland Restoration Project by sending a consultation letter and an updated copy of the SOPA to the Havasupai Tribe, the Hualapai Tribe, and the Kaibab Band of Paiute Indians, the Navajo Nation, the Yavapai-Prescott Indian Tribe and the Pueblo of Zuni. On May 7, 2003 the Kaibab National Forest received a letter from the Pueblo of Zuni stating that the Pueblo of Zuni had no concerns regarding the proposed project. No other concerns, questions, or comments about the project were received by the Forest.

On April 22, 2003 the Forest initiated public scoping of tribal communities by sending a copy of the SOPA to the Bodaway/Gap, Cameron, Coalmine, Coppermine, Lechee, Leupp and To’Nanees’Dizi Chapters of the Western Navajo Agency. No concerns, questions, or comments about the project were received by the Forest in response to that letter.

Issues Raised During Scoping

The Forest Service separated issues into two groups: significant and non-significant issues. Significant issues were defined as those directly or indirectly caused by implementing the proposed action. Non-significant issues were identified as those 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, “...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)...”

During Proposed Action scoping (2003) thirteen comments were received. During the comment period in 2006 several interested parties repeated previous comments. From these comments, the Forest Service identified three issues that were potentially significant; they were resolved by making minor changes to the proposed action. These issues are identified in Table 1. Additional non-significant issues identified during Proposed Action scoping, and reasons regarding their categorization, are in Table 2.

Table 1. Three Issues That Were Potentially Significant

Issue Statement	Resolution
Adverse effect to property values and visual quality	To minimize visual concerns near homes, a 300 foot buffer zone would be implemented next to private property; an average of 50 trees per acre would be retained in natural groupings.
Increased danger to residents from hunters	Prior to implementing treatments, the Forest Service will place warning signs and shooting restrictions within ¼ mile of occupied buildings.
Log hauling on the 141 and 144 roads would create dust and impact air quality	Dust impacts will be mitigated by restricting log trucks to 15 mph for a one-mile stretch along Forest Roads 141 and 144. In addition to dust abatement, alternate hauling routes would be used when feasible resulting in the minimum number of trips passing through the areas of concern.

Table 2. Non-significant issues

Issue Statement	Response
Pronghorn don't need clearings	Pronghorn are adapted to “sight and flight” behavior and avoid vegetation and terrain features that hinder visibility or their ability to run at full speed.
Large areas of grassland to the north provide suitable habitat	Suitable grasslands to the north are the summer range of the local pronghorn herd; they also need suitable winter range and safe travel between.
Not necessary to restore to past conditions; project would “traumatize the entire area”	Vegetative trends post Euro-American settlement has resulted in the loss of grasslands and pine savannas. The Proposed Action would restore conditions that existed less than 100 years ago. There is no evidence to support the claim that the project would result in traumatic effects.

Recent losses of trees from bark beetle and wildfire	Recent tree mortality from bark beetles is minimal in the project area. Wildfires have not occurred in the project area.
Prescribed burns may escape, damaging homes and forest	A number of measures are included within the Proposed Action to reduce the risk of an escaped prescribed burn. Plus prior to the ignition of any prescribed burn a detailed burn plan that includes specific perimeters (e.g. weather forecast, fuel moistures, etc) must be met in order to safely and effectively achieve the desired results. Additional measures may be taken, when deemed necessary, to provide for the needed protection of private property.
Other areas around Community Tank may be clearcut in the future.	The Proposed Action is specific to the action area to meet the Purpose and Need. There are no projects currently foreseeable, proposed for clearcut around the project area. Should a project be proposed in the future, its effects would be evaluated and considered within the context of past, present, and foreseeable actions.
Need to treat more acres and modify more fences	The Proposed Action addresses acres and fence modifications specific to the action area.
Adverse effects to elk habitat	Although the Proposed Action would remove some hiding and thermal cover for elk, the surrounding forested area would continue to provide ample habitat. The Proposed action would improve the quality of foraging habitat for elk.
Projects of this nature should not be done near private property	The Kaibab NF is directed by law and Forest Plan direction to manage for various objectives including reducing fuels adjacent to private property and improving wildlife habitats.

Based on the discussions provided in Tables 1 and 2 and the application of mitigation measures, the District determined that for the Community Tank project there were no significant issues identified from either public scoping or internal coordination.

Chapter 2 - Alternatives

This chapter describes and compares the alternatives considered for the Community Tank Grassland Restoration project. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative and some of the information is based upon the environmental, social and economic effects of implementing each alternative.

An Interdisciplinary Team considered the elements listed below when they developed the Alternatives for this analysis:

- The purpose of and the need for action identified in Chapter 1.
- The issues identified in Chapter 1.
- The goals, objectives, and desired conditions for the project area.
- Comments and suggestions made by the public, the State, and other agencies during the scoping process.
- The laws, regulations, and policies that govern land management on National Forests.
- Site-specific resource information.

Two alternatives were developed in detail for this environmental analysis process: the No Action alternative and the Proposed Action. Issues raised during scoping were considered resolved when they were addressed through land use designations, implementation of Forest Plan standards and guidelines and Best Management Practices (BMP's), project-specific design criteria or mitigation measures, through processes or analyses routinely conducted by the Interdisciplinary Team (IDT or ID Team), or were beyond the scope of the project.

The alternatives presented below represent a range of reasonable alternatives, given the purpose and need and issues raised during scoping.

Alternatives Considered but not Analyzed in Detail

An alternative was considered that would include a ¼ mile buffer. This alternative was suggested during the 30-day comment period and was analyzed for its effectiveness in meeting the objective of “maintaining a low risk for high intensity wildfire in the wildland-urban interface by reducing the live and dead fuel load by at least 30% over the next ten years” (see Purpose and Need for Action, EA Ch. 1). Additional fuels analysis, focusing on the 300 foot buffer, shows that the current fuel condition of the area include low crown base heights which are directly related to an increase of crown fire potential and spotting. This kind of fire behavior is difficult to control and historically has spread beyond desired boundaries. The numerous trees also add to the accumulation of forest floor fuel loadings which can be a major contributor to high intensity fire behavior and can be difficult to control. A buffer distance of greater than 300' would leave the area in a state of concern and would not meet the purpose and need for action.

Alternative 1 - No Action

Under the No Action Alternative other resource activities (i.e., grazing, recreation, wood cutting, special-use permits, etc.) would continue to occur. No grassland restoration activities identified under the Proposed Action (Alternative 2) would be implemented. Trees would continue to encroach into historic

and existing grasslands, and habitat quality and quantity for grassland species would continue to decline as forest cover continues to expand. In addition, the risk for high intensity wildfire in the wildland-urban interface would not be reduced.

The No Action Alternative is used as a baseline to compare effects with the Proposed Action Alternative. This alternative allows previously approved (ongoing) activities to continue, but none of the treatment proposed in the Community Tank project area would occur.

Alternative 2 - Proposed Action

Alternative 2, the Proposed Action, was designed to meet the Purpose and Need, as well as the stated objectives, in order to move the project area in the direction of the desired condition. The primary goal is to effectively restore historic grasslands and improve habitat for grassland species. Under the Proposed Action Alternative, five separate activities are planned to achieve this goal in the Community Tank project area. The proposed activities are shown in Figures 2, 3, and 4, and are described in more detail.

Vegetative Treatments

The Proposed Action would reduce live tree densities on 1,050 acres similar to the historic grassland/savanna conditions estimated to be in the area prior to livestock grazing and fire suppression. Past livestock grazing reduced competition to conifer seedling establishment and created a favorable seedbed. During the same time, fire suppression allowed higher than average trees to survive than occurred under a natural frequent fire regime. To prevent pronghorn sight distance from becoming obstructed, and also to meet the Scenic Integrity Objectives (SIO) for the area, activity slash would generally be lopped or mechanically crushed to less than 2 feet in height. Piling or crushing would occur for timber sale operations and for heavy concentrations of slash. The burning or removal of piles would be prompt after treatment. Piles may be used or sold for biofuel. The Forest Service may offer limited personal-use fuelwood permits, to reduce the amount of slash in specific areas; these permits may include a provision for limited cross-country travel. Activity slash in the northwestern finger of the project area (see Figure 4) would be 100% piled and burned. The reason for piling and burning of slash on this site is to lower fuel loads along the base of Moritz Ridge and to reduce the uncharacteristic high intensity fire risk.

Where possible the felled trees would be sold for wood products (sawtimber, roundwood, and biomass). Commercial removal is preferred because the boles of the trees would be removed from the site, reducing the potential fuel load created by the project and reducing obstacles to pronghorn movement.

If commercial sawtimber and/or roundwood are hauled from the area on log trucks, roads used to access commercial sites would be maintained and or improved by the purchaser to reduce erosion problems. The primary haul routes would be Forest Road 720 west to County Road 144, south to County Road 141, and Forest Roads 724 and 710, east to Forest Road 194 and west to County Road 141. If all commercially identified units are sold, log truck traffic from the Community Tank area could be up to twenty truckloads per day, with up to 625 total truck loads for the project (8 CCF per truckload). 15% of the vegetative treated areas could be hauled out the North West route. Approximately 90 truckloads could potentially be hauled out FR720, 4.5 to 7 days of hauling, if 20 truck loads a day are being accomplished.

The following implementation specifications apply:

- All “yellow pines” would be retained. Yellow Pines are generally 140+ years of age and have characteristics of yellow platy bark, large diameter lower limbs, and flattening tops.
- All junipers greater than 16 inches in diameter and pinyon pine greater than 12 inches in diameter would be retained.
- Where evidence exists of trees living 100 years ago (snags, down logs, stumps, or stump holes), one to two trees would be retained as replacement trees. Generally, the largest trees near the evidence would be retained to mimic historic distribution.
- Within 300 feet of private property an average of 50 trees per acre will be retained in natural clumpy patterns to provide for visual screening (buffer areas).
- Large dead trees (snags) would be retained except where they pose a significant fire or safety risk and promote a hazard in logging operations.
- Activity slash would be lopped and scattered or mechanically crushed to a height of less than 2 feet in height, except that piling would occur for timber sale activity slash and heavy accumulations of non-commercial slash to reduce fuel accumulations that exceed fuel load objectives.

Prescribed Burning

Approximately 1,400 acres of prescribed burning is proposed. About 860 acres of the burning will be combined with vegetative treatments and 540 acres would have prescribed burning only. To prevent future encroachment of ponderosa pine, pinyon pine, and juniper, maintenance burning would continue on a 4 to 12 year interval over the next 20 years.

- When fuel conditions pose a risk to retained yellow pine, pinyon pine, and junipers greater than 18” in diameter, heavy fuels will be moved from the base of these trees. This would be done when the needle cast and forest duff layer combined are greater than 6 inches deep or when large limbs, logs, or activity slash are located near the tree’s base.
- Prescribed burning would generally take place in the fall or winter to limit the impacts to cool season grasses and migratory bird nesting activity.
- Dozer lines or hand lines would be constructed in areas where roads or other suitable fuel breaks do not exist.
- Dozer lines would be rehabilitated by ripping and providing suitable drainage.
- Activity slash in the northwestern finger of the project area would be piled and burned to reduce fuel loadings along the southwest base of Moritz Ridge, where high tree densities contribute to the potential for high intensity fires.
- Pile burning would take place within 2 years after the vegetation treatments, contingent on environmental conditions allowing.

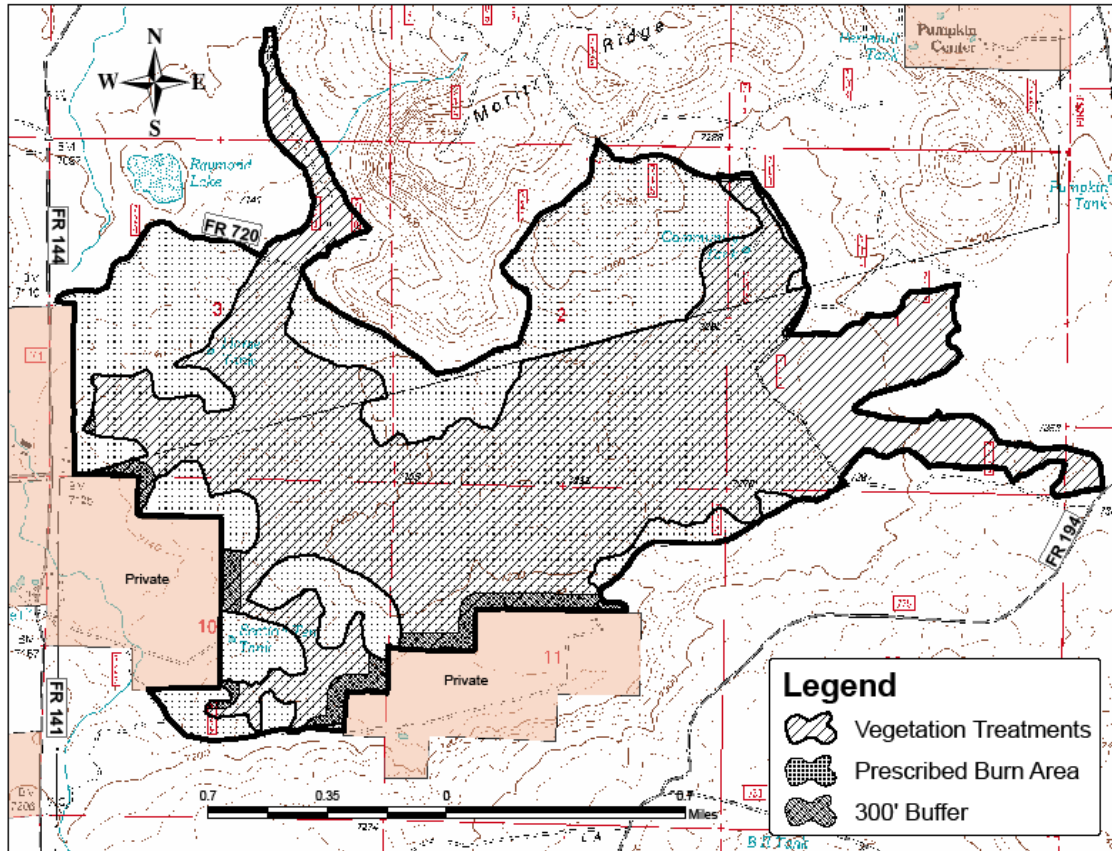


Figure 2. Proposed Action: Vegetative Treatment, Prescribed Burn, and 300 Foot Buffer Areas.

Road System

A road analysis process was conducted for the Community Tank project area concurrently with the Transportation Analysis completed under the 2005 Travel Management Rule (TMR). The interdisciplinary team analyzed the road system within and immediately adjacent to the proposed project area. The analysis area contained 11.2 miles of forest roads: 10.2 miles of Forest Service roads and 1.0 mile of private roads. Based on this analysis, 2.2 miles of roads are proposed to be closed under the Travel Management Rule and no new road construction is being proposed (see Figure 3). The roads proposed for closure are either dead end roads or roads that are not needed because they run parallel to other roads that will remain open. Vehicle access to private property will not be affected. The proposed action would obliterate 2.2 miles of roads within the Community Tank Grassland Restoration Project area, consistent with the Williams Ranger District Travel Management Proposed Action.

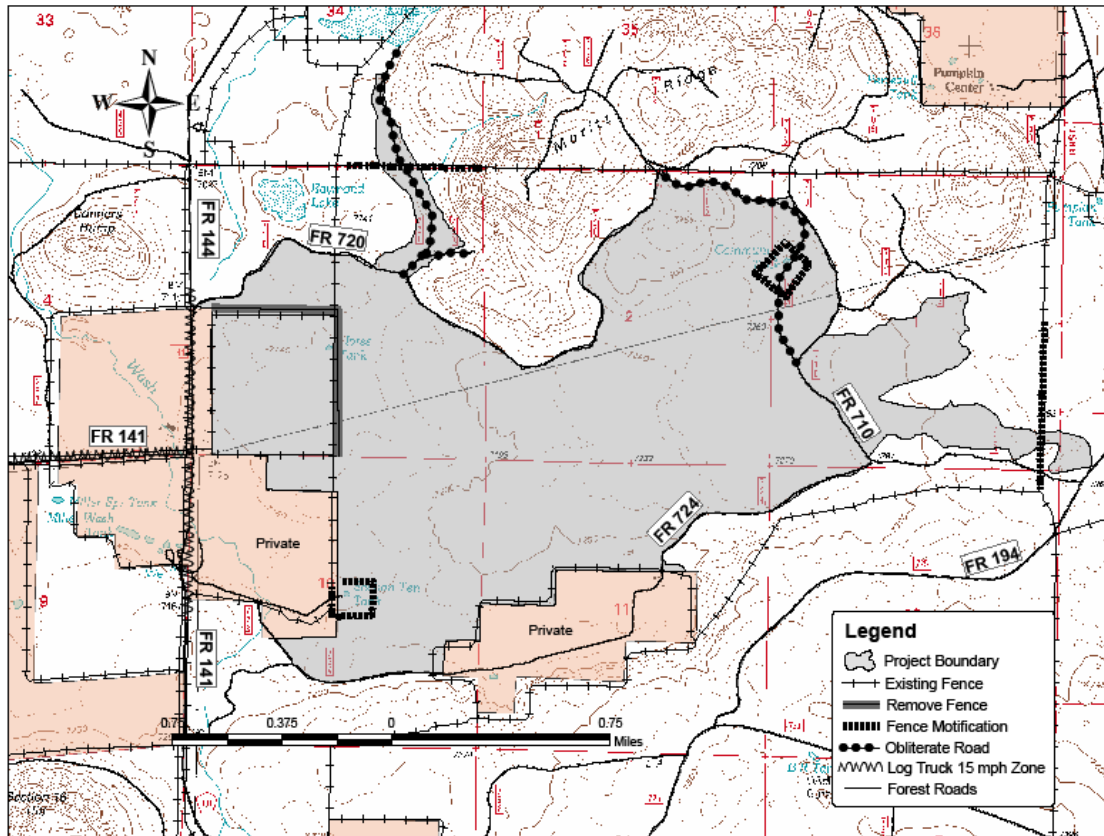


Figure 3. Proposed Action: Roads and Fences

Fence Modifications and Removals

The Proposed Action would remove approximately one mile of non-functional 4-strand barbed wire fencing to improve pronghorn travel through the area. This fence is currently falling down and is no longer serving any purpose. It is located on Forest Service land in the western portion of the project area. To better facilitate pronghorn movement, fence modifications that would add pronghorn crossings to two ½ mile sections of fence are also proposed. These ½ mile sections are in the highest use/highest priority areas. Additional fence improvements could be made if funds are available and crossings would be installed on the fences that enclose Community Tank and Section Ten Tank.

Re-designation of Land Suitability (Site-Specific Forest Plan Amendment)

The Community Tank area has been identified by Forest Service biologists and the Arizona Game and Fish Department as an area where there are critical needs for grassland restoration to alleviate pressure on antelope travel corridors which was originally grassland less than one hundred years ago. The proposed action proposes to reallocate 800 acres of forested ponderosa pine cover type to be managed for critical wildlife habitat. (Note: the additional 250 acres of the proposed action are currently classified as grasslands.) The area proposed for this reallocation would be managed for a lower percentage of forest canopy cover than is specified as a desired condition for the ponderosa pine cover type in the Kaibab Forest Plan for the northern goshawk. The District wildlife biologist has determined that this change in management for these sites will have no significant effect on the northern goshawk. This reallocation would constitute a site-specific non-significant Forest Plan amendment for these acres only.

The reallocation would designate 46 acres of “suitable” ponderosa pine forest and 754 acres of “unsuitable” ponderosa pine forest to be managed as “critical wildlife habitat.” This will require a change of timber component codes for this acreage from either a 500 code (land suitable for timber production) or a 700 code (unsuitable forest land) to an 800 code (critical wildlife habitat). The following sites would be proposed for the reallocation: 2231-7, 2231-8, 2231-9, 2231-10, 2231-11, 2238-8, and 2238-11. See Figure 4 for the location of these sites.

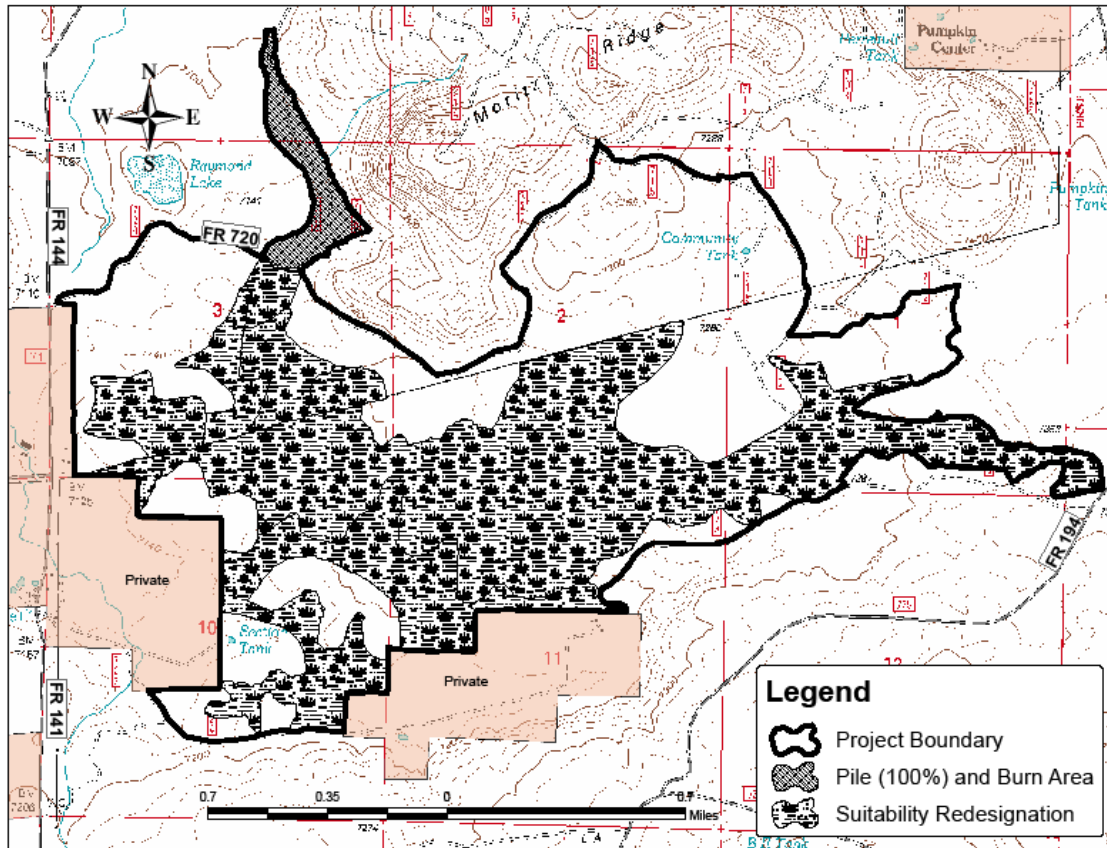


Figure 4. Pile and Burn Area and Suitability Re-designation Area.

Mitigation Measures for the Proposed Action Alternative

In alternative design and in response to public comments on the proposal, mitigation measures were developed and will be applied to reduce potential environmental impacts the Proposed Action Alternative may have and minimize concerns. The following mitigation measures will be implemented, along with standard Best Management Practices (see Appendix: A):

1. To minimize visual concerns associated with activity slash near homes, activity slash will be pulled back 100 feet from private property and slash between 100 and 300 feet from property will be hand or grappled piled to a maximum height of 10 feet. See Figure 2, (300 foot buffer).
2. Log trucks would not use the private portion of Forest Road 724 in Section 11.
3. Log truck traffic will be restricted to 15 mph for a one-mile stretch along Forest Roads 141 and 144 in the area near homes on the western side of Sections 3 and 10. Notify landowners along the one-mile stretch before hauling begins.

4. Upon implementation of this project, the Forest Service will place additional signs on roads within the project area that will warn hunters of nearby residences and of shooting restrictions within ¼ miles of occupied residences.
5. The burning of piles would take place within 2 years after the vegetation treatments, contingent on environmental conditions allowing.
6. Lopped and scattered or crushed activity slash will be a maximum of 2 feet in height.
7. No trees will be cut on 24 acres that is within the goshawk post-fledgling family areas (PFA). If the goshawk territory is occupied, avoid landing and hauling operations within the PFA and along the road that runs through the site during the goshawk breeding season (March 1 through September 30).
8. When selecting leave trees, retain some trees with lightning strikes and/or dead tops. This would retain deadwood (i.e. snag) substrate in the event of low intensity fire (prescribed fire).
9. Dead and down material 12 inches in diameter and 8 feet long in length will be protected by different style of ignition pattern and/or avoiding of direct ignition.
10. Protect all fences from damage from tree falling, tree skidding, slash piling, and prescribed burning. Repair all fences, as soon as possible, if any are accidentally damaged by project activities.
11. Use designated skid trails and landings.
12. Range monitoring transects clusters and witness trees will be flagged before work begins. Do not cut down witness trees or damage transect posts. Do not skid trees or drive across the transects. Do not pile slash and/or burn piles along the transects.
13. Equipment shall not be operated when soil conditions are such that excessive compaction, rutting or accelerated soil erosion will result.
14. Remove mud, dirt, and plant parts from project equipment before moving it into the project area. This practice does not apply to service vehicles traveling frequently in and out of the project area that will remain on a clean roadway.
15. Design the broadcast burn prescription, so that it will minimize the potential spread of cheatgrass.
16. Conduct broadcast burns at low intensity in most areas, so that at least 20% cover of vegetation remains to protect the soil. Litter can be used to provide ground cover where there is insufficient understory plant cover.
17. Rip (rehabilitate) compacted soils on skid trails, landings, and fire lines after use.
18. Coordinate with the grazing permittee to regulate livestock grazing during and after the broadcast burning in order to protect livestock and emerging vegetation.
19. Re-establish natural drainage contours on obliterated roads. Effectively block access.
20. Project Managers must consult with Forest or District Archeologist prior to implementation.
21. Prior to any timber related activities, project managers must ensure that all heritage sites are marked for avoidance.
22. Timber crews may hand-fell timber on any heritage site as long as the slash and boles are carried off the site by hand, no piles within site.
23. Historic sites -1370 and -1371 must be protected from burning activities.
24. If any unrecorded sites are found in the project area, then work in the area must cease and the contract administrator or project team leader must contact the Forest Archeologist immediately.

Monitoring of Proposed Action Alternative

The following monitoring is included as part of the proposed action:

- Monitor Pronghorn activity with reporting of incidental sightings to the district wildlife biologist and evaluation of Arizona Game and Fish department's pronghorn population surveys.

- Monitor the project area for noxious or invasive weed populations for at least five years after project completion.
- Monitor vegetative and fuels treatments with a site walk through, to evaluate how well the treatment met project objectives.
- Range monitoring transects clusters can be used to monitor understory vegetation to evaluate how well the treatment met project objectives.
- Post vegetative and burning treatment stand exams can be utilized to determine if desired conditions were met.

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in Table 3 is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives. Greater detail is available in Chapter 3.

Table 3. Summary of effects for the Community Tank project area.

Environmental Effect	Alternative 1 – No Action	Alternative 2 – Proposed Action
Wildlife Habitat		
Pronghorn antelope	Trees would continue to encroach into existing grasslands and forest openings, further reducing the quantity and quality of pronghorn habitat.	Habitat quality and quantity in pronghorn movement corridor would be increased. Some fences would be modified or removed facilitating pronghorn travel. Wildlife/vehicle encounters would be reduced.
Other wildlife species associated with grassland and open pine habitats	Habitat quality and quantity would continue to decline as forest cover continues to expand and become increasingly dense. Production of grasses, forbs, and shrubs would continue to decrease as canopy closure continues to increase.	Habitat quality and quantity would increase as a result of thinning and burning treatments. Species that would benefit most include Gunnison's prairie dog, spotted ground squirrel, and badger, various bird species such as northern harrier, barn owl, barn swallow, horned lark, northern mockingbird, lark sparrow, vesper sparrow, Savanna sparrow, and western meadowlark.
Wildlife species associated with ponderosa pine forests, snags, and logs	Habitat quality and quantity would continue to increase as ponderosa pine forest expands and becomes increasingly dense and older. Species that would benefit most include Allen's lappet-browed bat, Abert's squirrel, various bird species such as hairy woodpecker, pygmy nuthatch, white-breasted nuthatch, mountain chickadee, brown creeper, golden-crowned kinglet, yellow-rumped warbler, Grace's warbler, red crossbill.	Habitat quality and quantity would decrease because 800 acres currently classified as ponderosa pine habitat type would be converted to grassland/savanna habitat type to meet the project objectives. However, ponderosa pine forest similar to that in the project area is much more extensive than grassland and savanna habitats on the Williams District, especially when compared to historic conditions. Habitat impacts would occur at too small of a spatial scale to affect population trend or status at the scale of the Kaibab NF for any of the species evaluated.
Mexican spotted owl	No spotted owl habitat within project area, but continued increases in canopy volumes and forest floor fuels in project area increase long-term risk of high-severity crown fire that could impact spotted owl PACs and other Protected and Restricted habitats on Kendrick Mountain approximately 2-3 miles northeast of the project area.	Smoke from pile burning and broadcast burning treatments may cause short-term negative effects to spotted owls northeast of the project area on Kendrick Mountain. Reduction in the risk of high-severity crown fire impacting spotted owl habitat around Kendrick Mountain.

Environmental Effect	Alternative 1 – No Action	Alternative 2 – Proposed Action
Northern goshawk	Habitat quantity and quality would continue to increase as ponderosa pine forest expands and becomes increasingly dense and older.	Habitat quality and quantity would decrease because 800 acres currently classified as ponderosa pine habitat type would be converted to grassland/savanna habitat type to meet the project objectives. Habitat impacts would occur at too small of a spatial scale to affect population trend or status of goshawks at the scale of the Kaibab NF. Reduction in the risk of high-severity crown fire impacting goshawk territories surrounding Community Tank project area.
Overstory Vegetation		
Tree Density	Current tree densities would be retained. Numbers of trees and percent canopy closure would gradually increase over time.	Tree densities will be reduced in the proposed vegetative treatment area to an approximate average of 0.33 trees per acre with an overstory canopy cover of one to three percent. In the prescribed burning only area, tree densities will be reduced to approximately 90 to 110 trees per acre from mortality due to the burn with an average of 40 to 45% canopy cover.
Vegetation Cover Types	The vegetation cover type would be more than 80% ponderosa pine. Over time the remaining grassland would become smaller and eventually disappear as trees continue to encroach.	The area proposed for vegetative treatments would be returned to open grassland. Prescribed burns would help to maintain these grasslands over time.
Vegetative Structure	Grassy forest openings would be lost over time as the overstory canopy expands and new trees continue to regenerate in these openings. Grasses, forbs and shrubs would continue to decrease. Over time the forest will become less diverse as Ponderosa pine eventually replaces much of the juniper, pinyon pine, and new pine regeneration and the forest will move towards a more homogenous even-aged condition. Individual tree diameter and crown growth rates would decrease over time.	Small openings would be created and maintained in areas that are proposed for burn only treatments. In the area proposed for vegetative treatments a very open meadow/pine savanna condition would be developed. Trees would be very scattered and many large areas of 5 acres and more in size would have no trees at all. Grass and forb production would be greatly increased over a longer period of time. The residual trees would develop into larger diameter classes much more quickly and would also develop large fuller crowns with larger limbs. Residual tree longevity would be increased.

Environmental Effect	Alternative 1 – No Action	Alternative 2 – Proposed Action
Large Trees	The number of trees greater than 18" in diameter or greater would remain the same initially and would increase over time as new trees grow into this diameter class. Over time, the forest would become denser and the risk of losing these trees to wildfire or bark beetle attack will increase. Tree growth rates will decrease as the forest becomes denser.	The number of large trees greater than 18" in diameter will initially be reduced from an average of 7.0 trees per acre to 0.2 trees per acre. Vegetative treatments will initially retain all yellow pine, all ponderosa pine generally with characteristics of yellow platy bark, large diameter lower limbs, and flattening tops, all junipers greater than 16" in diameter, and pinyon pine greater than 12" in diameter. The number of these trees would be further reduced by up to 5% from prescribed burning. Large trees remaining after treatment would be less susceptible to mortality from wildfire and bark beetle attack. Residual tree diameter growth rates will be 2 to 3 times more than they would be without treatment. In the area proposed for burn only, the number of trees greater than 18" in diameter will be reduced by 0 to 5% from prescribed burn mortality or from an average of 3.4 to 3.6 trees per acre.
Understory Vegetation		
Threatened and Endangered Plants.	There are no threatened or endangered plants in the area. No effect.	There are no threatened or endangered plants in the area. No effect.
Sensitive plants	Increased risk of destruction by high intensity wildfire.	There is suitable habitat for Rusby's milkvetch and Flagstaff beardtongue. Both species respond favorably to low and medium intensity fire.
Noxious Weeds	There would be a long-term downward trend to resistance to invasion from an increased risk of high intensity wildfire.	There are no known noxious weeds in the area. Bull thistle, cheat grass and Dalmatian toadflax are known to occur in close proximity. Burning and thinning have the potential to create small patches of bare soil, which would result in a short-term vulnerability to invasion by noxious weeds.
Fuels and Fire Behavior		
Potential Fire Behavior	No reduction in current fuel loading or potential fire behavior. The gradual increase in fuel loading over time would result in longer flame lengths and a landscape that is more susceptible to stand replacing wildfires	Fuel loading would be reduced to desired levels (0-7 tons/acre). Ladder fuels would be reduced. Prescribed burning would result in a more natural mosaic of fuel conditions across the landscape.
Smoke/Air Quality	No emissions or particulates from prescribed burns. However, large amount of smoke could be generated in the event of a wildfire. Smoke from wildfires would likely produce more emissions that last longer because both live and dead fuels would be consumed	Short term smoke impacts on burning days during project implementation. Smoke impacts would be managed in accordance with ADEQ standards and guidelines.
Heritage		
Heritage Resources	No potential ground disturbance associated with project activities. No reduction in threat to heritage resources from wildfire.	A heritage resource clearance was completed for this project with SHPO concurrence. All heritage resources will be protected. Project activities are in compliance with the National Historic Preservation Act. Project would have some reduction in threat to heritage resources from wildfire.

Environmental Effect	Alternative 1 – No Action	Alternative 2 – Proposed Action
Soils/Watershed		
Soil and Watershed Condition	No increased soil exposure from use of heavy machinery. Increased risk of broad-scale soil exposure from high intensity wildfire.	Thinning and burning would likely create small patches of bare soil, and slightly increase erosion over the short term. Live plant cover and vegetative litter would increase within a few years, resulting in a static to upward trend in soil and watershed condition over the long term.
Recreation Resources		
Recreation Opportunity Spectrum	No change to the ROS, the setting would remain at Roaded Natural and Rural.	Short-term reduction to the ROS with a recovery time of 1-2 years after treatment of slash. Long-term improvement of the ROS with the reduced potential for uncontrolled wildfire and insect outbreaks.
Scenic Integrity Objective	No change to the SIO of High.	Short-term negative effect during project implementation, with a recovery of SIOs at 1 to 2 years after the treatment of slash.

CHAPTER 3 - ENVIRONMENTAL EFFECTS

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in Table 3 (Chapter 2).

OVERSTORY VEGETATION

Affected Environment

The overstory vegetation affected environments are the grassland and ponderosa pine forest habitats in the Community Tank area. The Community Tank area is mostly flat bottomlands; ridges and gently raised uplands surround these bottoms. Currently the project area is dominated by ponderosa pine with some alligator juniper and pinyon pine mixed in.

Direct and Indirect Effects on Overstory Vegetation

Alternative 1 – No Action

Tree Density – Tree densities would be retained. In areas proposed for vegetative treatments it would remain at an average of 68 trees per acre with an average of 30% overstory canopy cover. In the areas proposed for prescribed burning only, densities would remain at an average of 120 trees per acre with an average of a 45 – 50% canopy cover. Numbers of trees and percent canopy closure would gradually increase over time in the entire analysis area.

Vegetation Cover Types – Greater than 80% of the analysis area would remain as a ponderosa pine forest cover type. Over time the remaining grassland cover types in the area would become smaller and eventually would be lost as trees continue to regenerate in and encroach upon them.

Vegetative Structure – Grassy forest openings would be lost over time as the overstory canopy expands and new trees continue to regenerate in these openings. Grasses, forbs and shrubs would continue to decrease. Over time the forest will become less diverse as ponderosa pine eventually replaces much of the juniper, pinyon pine, and new pine regeneration, and the forest will move towards a more homogenous even-aged condition. Individual tree diameter and crown growth rates would decrease over time.

Large Trees – The number of trees greater than 18" in diameter would remain the same initially and would increase over time as new trees grow into this diameter class. As the forest becomes denser, the risk of losing these trees to wildfire or insects will increase. Tree growth rates will decrease as the forest becomes denser.

Alternative 2 – Proposed Action

Tree Density – Tree densities will be reduced in the proposed vegetative treatment area where the objective is to restore grassland and ponderosa pine savanna conditions, to an approximate average of 0.33 trees per acre with 1 to 3% overstory canopy cover through tree felling and mortality from prescribed burning. In the prescribed burning only area, tree densities will be reduced to approximately 90 to 110 trees per acre from mortality due to the burn with an average of 40 to 45% canopy cover.

Vegetation Cover Types – The area proposed for vegetative treatments would be returned to an open grassland cover type. Future maintenance prescribed burns and possibly further felling of new tree regeneration will be required to maintain this cover type over time.

Vegetative Structure – Small openings would be developed and maintained in areas that are proposed for burn only treatments. In the area proposed for vegetative treatments a very open meadow/pine savanna condition would be developed. Trees would be very scattered and many large areas, of 5 acres and more in size would have no trees at all. Grass and forb production would be greatly increased over a longer period of time. The residual trees would develop into larger diameter classes much more quickly and would also develop large fuller crowns with larger limbs. Residual tree longevity would be increased.

Large Trees – Within the area proposed for vegetative treatments, the number of large trees greater than 18” in diameter will initially be reduced from an average of 7.0 trees per acre to 0.2 trees per acre. Vegetative treatments will initially retain all yellow pine, all ponderosa pine generally with characteristics of yellow platy bark, large diameter lower limbs, and flattening tops, all junipers greater than 16” in diameter, and pinyon pine greater than 12” in diameter. The number of these trees would be further reduced by up to 5% from prescribed burning. Large trees remaining after treatment would be less susceptible to mortality from wildfire and bark beetle attack. Residual tree diameter growth rates will be 2 to 3 times more than they would be without treatment. In the area proposed for burn only, the number of trees greater than 18” in diameter will be reduced by 0 to 5% from prescribed burn mortality or from an average of 3.4 to 3.6 trees per acre.

Cumulative Effects on Overstory Vegetation

The time frame selected for the silvicultural resource cumulative effects analysis is from 15 years ago to 10 years from now. The cumulative effects analysis area includes the ponderosa pine and pinyon-juniper forest types found in the northeast area of the District. The approximate boundaries of the analysis area are north of Interstate 40, west of the Coconino/Kaibab boundary, south of the northern district boundary and east of Highway 64. The cumulative effects analysis area is about 213,000 acres in size. The northern half is predominated by woodlands and the southern half is predominated by timberlands.

Relevant past, ongoing, and reasonably foreseeable projects include the following vegetative treatment, grassland/savanna improvement, prescribed burning, and aspen restoration projects: Red Rock Grassland Maintenance (GLM), Smoot Lake GLM, South Bull Trap GLM, Antelope GLM, Smoot Moritz GLM, Homestead GLM, Pedigo GLM, Eagle II GLM, Potatoe Hill GLM, Hardy GLM, Buggy Wheel GLM, TO GLM, Buggy Wheel GLM, Ivy GLM, Spring Valley, Beacon, McDermitt, Government, Marteen, Brann, Again, El Paso Roundwood, Parks, West Parks, Ebert Fuelwood, White Hills Fuelwood, Hobbles Fuelwood, Williams Follow-up Mistletoe Treatments, Williams High Risk PCT, Government Prairie Prescribed Burn, Barrier Prescribed Burn, and Kendrick Prescribed Burn.

In the past 15 years, the analysis area has had some sort of vegetative treatment on approximately 13,000 acres. Vegetative treatments are defined as silvicultural treatments that involve felling trees. These treatments included low thinnings, sanitation cutting, group selection cuts, individual tree shelterwood cuts, and grassland/savanna restoration cuts. Vegetative treatments included commercial logging treatments, commercial fuelwood sales, noncommercial thinning/sanitation treatments, and combinations of all these methods. Vegetative treatments were usually followed with activity slash treatments including lopping, piling and burning, and/or prescribed under burning. Past vegetative treatments included 7,600 acres that were treated to restore grassland savanna conditions. In the next 10 years, approximately 12,400 acres of vegetative treatments are planned for the cumulative effects analysis area. 2,550 acres of these treatments will be grassland/savanna restoration treatments. For the 25-year period, beginning 15 years ago and ending 10 years from now, a total of 25,400 acres of vegetative treatments

have either been done or are planned to be accomplished. This is approximately 12% of the cumulative effects analysis area. 10,150 acres of these treatments, during this time period, are grassland/savanna restoration treatments. This is approximately 5% of the cumulative effects area.

Over the past 15 years, 20,125 acres of the cumulative effects analysis area has been under burned. Including the proposed action, 15,190 acres of under burning is planned in the next 10 years within the analysis area. Over the 25-year cumulative effects analysis period, approximately 35,315 acres have been or are planned to be under burned. This is approximately 17% of the cumulative effects analysis area. In addition to this prescribed burning there has been an additional 10,120 acres that have been burned by wildfires. Of this, approximately 3,000 acres had severe wildfire that removed most of the forest canopy (1 ½% of the cumulative effects area).

The effect of these past, current, and foreseeable actions is a landscape with decreased tree densities, more and larger forest openings, and a more diverse vegetative structure. The cumulative effect of the proposed action when combined with these other actions is an augmentation of these positive effects, resulting in a healthier, more diverse forest that is less susceptible to loss from insect outbreaks or stand replacing wildfire.

Old Growth and Goshawk Habitat Structure: Three Scales of Analysis

The purpose of this analysis, for the Community Tank Restoration Project, is to evaluate the distribution of Northern Goshawk habitat structures and the status of old-growth at three scales. The Forest Plan was corrected in November 2008 to make language consistent between the Forest Plan and the Regional EIS for the 1996 Plan Amendments. Ecosystem Management Areas (EMAs) were renamed to Geographic Areas, but retained their numerical designations. Geographic Areas encompass smaller management areas called landscapes (now renamed EMA) that average 10,000 acres to 20,000 acres. The Beale EMA encompasses the community tank project area.

Current Overstory Conditions in the Beale Landscape (EMA)

This analysis area has the following stand averages:

- 203 trees per acre; 58.71 % canopy cover;
- basal area of 95.03 square feet per acre;
- Average tree size of 10.2 DBH, and a Stand Density Index of 197.

VSS distribution of the EMA is primarily even aged, with VSS 4 representing almost 40% of the structural classes (Figure 5). VSS 5 and 6 classes are under represented, collectively 21% of the age classes. These larger tree classes in the EMA have become a minority to younger and smaller VSS classes such as VSS 1-4s.

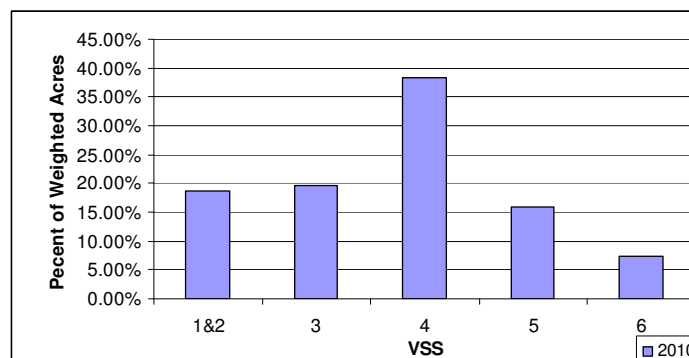


Figure 5. Histogram of Current VSS within EMA

Three Scale Analyses of Northern Goshawk Habitat Structures

The Forest Plan requires that the effects for vegetative structure are assessed at three scales, the large scale being the Ecosystem Management Area (EMA), the mid-scale being, for example a watershed, or as is more appropriate for this analysis, the project area, and the small scale of site. The three scale analysis for the Community Tank Restoration project, on Northern Goshawk habitat structures, was conducted at the small scale (stratified ponderosa pine typed stands, outside of goshawk post-fledgling family areas within the project area), the entire project area including plan amended acres (mid-scale) and Landscape level (EMA). EMA and project area scales are displayed in Figure 6. The small scale focuses on the areas outside of goshawk post-fledgling family areas, only in the ponderosa pine type. Goshawk post-fledgling family areas (PFA) were excluded from the three scales of analysis because the project area only consists of 24 acres PFA, comprising of 1.5% of the project area and .14% of the EMA. The proper mitigation measures ensure the protection to the PFA and fire effects would be similar to the areas outside post-fledgling family areas, therefore maintaining larger trees and promoting the higher canopy cover specified for PFAs. The effects from the small scale are then averaged to the mid scale and EMA. Areas excluded in the small scale analysis are grassland typed stands, plan amended grassland re-designated areas, goshawk post-fledgling family areas and all other vegetation types except ponderosa pine, because goshawk habitats in ponderosa pine are within the scope of this analysis.

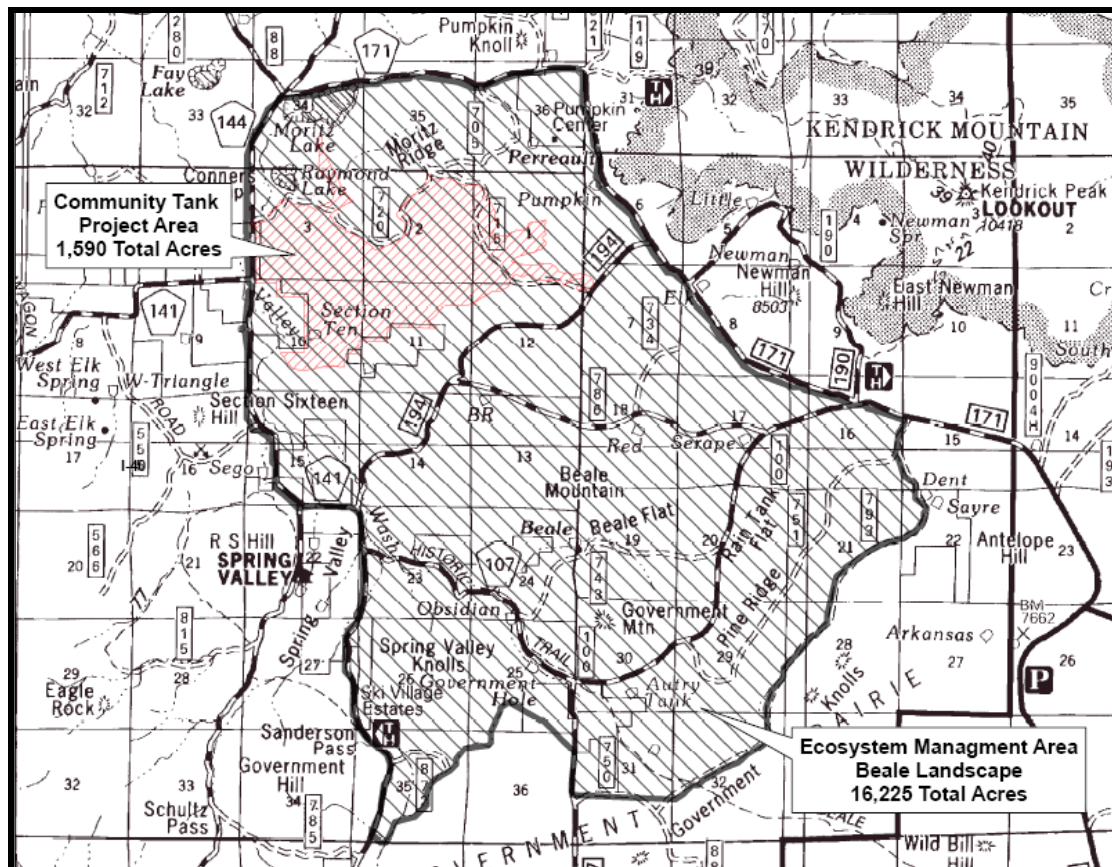


Figure 6. Goshawk Habitat Structures, 3 Scales: The landscape analysis area used for the Community Tank Restoration project was pre-determined and delineated in the forest plan.

The Community Tank landscape, named 'Beale', is 16,225 acres in size and encompasses the whole project area. The Community Tank project area, 1,592 acres in size, is approximately 10% of the Beale landscape. Data used for the analysis was derived into point data from FSVEG/RMRIS and analyzed in the FVS model. Point data gives an accurate representation to the tree and group level. Canopy cover was

derived from FSVEG/RMRIS basal area data into Shepperd et al.'s 2001 crown cover formula displayed in 2002 USDA document. Point data used to derive the small scale data reflects the required "small scale of site". This degree of accuracy provides a better representation to all attributes measured, especially VSS. The attributes are then averaged and extrapolated through the associated scales of analysis.

Direct and Indirect Effects for Goshawk Habitat Structures

Goshawk Habitat Structures Alternative 1-No Action

There would be no change to the existing condition and trends for the Beale Landscape analysis area, see Figure 5. The unchanged excesses in fuel loading and ladder fuels in this alternative along with dense growing conditions would leave the area at high risk for insects, diseases and uncharacteristic stand replacing wildfire. These unforeseeable catastrophic events would have a negative effect on the landscape diversity of northern goshawk habitat structures throughout the Beale Landscape. Stand structures, horizontal and vertical, would persist in the even age fashion.

Goshawk Habitat Structures Alternative 2-Proposed Action

Increased protection from fire, to goshawk managed stands within and adjacent to the project area, would be a direct effect of the proposed action. The contribution of landscape diversity resulting from the proposed action would promote variable resistance to crown fires, and progress toward the uneven-aged forest conditions. The proposed action would also promote and protect goshawk habitat structures within the project area's ponderosa pine type, outside the site specific plan amended acres. The indirect effects from the proposed action to goshawk habitat structures are evaluated at the three scales of analysis.

Table 4 shows the various goshawk habitat structure's (VSS, snags, logs down woody debris and canopy cover) effect after treatment. The analysis in table 4 demonstrates the before and after treatment, to show the effects over a landscape level. The proposed action provides diversity of structure and function at the landscape level while managing and promoting goshawk habitat structure levels specified from the forest plan. The condition within the EMA, before and after treatment, remains even aged. The even age structure within the EMA can be noticed in table 4 by observing the high percent of VSS 4 with higher associated level of trees per acres shown in Appendix B, greater than any other class. This pulse of even age trees is slightly affected, moving toward the forest plan desired conditions, with the proposed action. Even though the community tank restoration project does not move the EMA completely away from an even age system, the proposed action is slightly moving the averages and percentages toward uneven age. The proposed action also promotes the increasing levels of VSS 5s and 6s within goshawk habitat within the project area. The increases positively affect percentages of VSS 5s and 6s at the EMA level. For other habitat structures within the EMA, trees per acre distribution remains variable when compared to the forest plan specified levels. Canopy cover, snags and down woody debris closely represents the forest plan goshawk habitat structure levels. Logs remain slightly below the forest plan levels but will move toward the desired habitat characteristic levels through time.

The mid scale level (project area) of analysis has one limitation regarding the averaging of goshawk habitat structure's (VSS, snags, logs down woody debris and canopy cover) with the site specific plan amended acres. Because the plan amended acres involves managing for critical wildlife habitat of grassland structures, the project area averaged levels would be below the levels specified in the forest plan. Natural mosaic burning effects would provide micro sites through time to cater for additional logs, coarse woody debris, across the landscape. Mitigation measures to maintain live trees with dead substrate provide the snags function on the landscapes that withstand frequent fire. Canopy cover would be maintained in the goshawk habitat areas. Even though these structures are moving toward the levels specified in the plan, canopy cover, coarse woody debris, logs and snags remain slightly below. Trees per acres remain variable and coincide with the even age VSS distribution.

The analysis of the small scale level, project area's ponderosa pine type stands outside of goshawk post-fledgling family areas, three scale attributes are increased with the proposed action compared to the

midscale level due to better representation of goshawk habitat. Small scale level over representation of VSS 3 and VSS 4 structures as well as their associated trees per acre levels, are well above the levels in the forest plan. Trees per acre distribution remains variable when compared to the forest plan specified levels. Canopy cover is reduced to the closer representation that the forest plan specified. Snags, logs and down woody debris remain slightly below the forest plan levels but will move toward the desired habitat characteristic levels through time with natural mosaic burning, providing micro sites through time to cater for additional logs and coarse woody debris. Mitigation measures to maintain live trees with dead substrate, provide the snags function on the the area that withstand frequent fire. Canopy cover would be maintained in the goshawk habitat areas.

Table 4. Scales of Analysis attribute and measurements table: Analysis effects are based on prescribed burning treatments in goshawk habitat and Vegetative treatments that promote critical habitat associated to grassland because of the site specific plan amendment.

Standards & Guidelines for Desired Conditions	Project Area Stands Outside of Goshawk Post-Fledgling Family Areas (Within Project Prescribed burning ONLY) 540 acres		Entire Project Area 1590 acres (Includes Plan Amendment Acres for Critical Grassland Habitat)*		Beale Landscape (EMA) 16225 acres	
	Pre Treatment	Post Treatment	Pre Treatment	Post Treatment	Pre Treatment	Post Treatment
VSS Percent by Acres						
VSS 1 and 2 (20%)	10.34%	10.34%	24.47%	71.28%	18.79%	18.51%
VSS 3 (20%)	31.03%	34.48%	24.47%	11.70%	19.62%	19.06%
VSS 4 (20%) (For old growth low site + 5,6)	51.72%	44.83%	37.23%	13.83%	38.41%	38.12%
VSS 5 (20%) (For old growth high site)	3.45%	6.90%	10.64%	2.13%	15.91%	16.44%
VSS 6 (20%) (For old growth high site)	3.45%	3.45%	2.13%	1.06%	7.27%	7.87%
Canopy Cover						
VSS 4/5/6, 40% to 70% (SS/MS)	58.48%	58.76%	53.27%	48.50%	58.71%	47.94%
Snags						
2 Snags/Acre (>18"DBH & 30' Long)	1.82	1.77	1.45	1.41	2.26	2.25
Logs						
3 Logs/Acres (>12"DBH & 8' Long)	0.74 Tons/acre ~ 1.48 logs/acre	0.67 Tons/acre ~ 1.34 logs/acre	0.63 Tons/acre ~ 1.26 logs/acre	0.53 Tons/acre ~ 1.06 logs/acre	0.85 Tons/acre ~ 1.7 logs/acre	0.92 Tons/acre ~ 1.84 logs/acre
Down Woody Material						
3" or greater on Forest Floor	2.71	2.54	2.99	2.03	3.93	4.21
Basal Area						
(old growth high site 90 BA, Low 70)	94.15	95.22	76.78	63.67	95.03	94.39

***The percentages at the mid-scale level (i.e. Project Area) represent the change created with the reclassification from lands of forest conditions to grassland savanna where there are no standards and guidelines for goshawk structures in grassland savanna.**

Three Scale Analyses of Old Growth Characteristics

The Forest Plan direction is to allocate no less than 20 percent of each forest Ecosystem Management Area (EMA) to old-growth. Allocations will consist of landscape percentages meeting old-growth condition and not specific acres. Old-growth should be evaluated at multiple scales, including one scale above and one scale below the EMA (pg. 32). The three scales used for analysis on old growth for Community Tank are: the Geographic Zone 2 (large scale), the Ecosystem Management Area (mid-scale landscape Beale), and the project area level (small scale). These scales are displayed in Figure 7.

The forest plan also states “The amount of old growth that can be provided and maintained will be evaluated at the ecosystem management area level and be based on forest type, site capability and disturbance regimes” (pg. 32). The Community Tank old growth analysis emphasizes on forest type and site capability based on the Forest Plan’s Table 15 ‘Old Growth Characteristics’.

Outside Mexican spotted owl management areas, the northern goshawk guidelines apply to the forest ponderosa pine type communities on the Kaibab NF unless amended site specifically. Standards in the plan state “Manage for old age trees such that as much old forest structure as possible is sustained over time across the landscape” (pg27). Outside of goshawk post-fledgling family areas, old forest is defined as Vegetation Structural Stage (VSS) 6 (pg29). VSS is defined as a generalized description of forest growth and aging stages based on the majority of the trees in the specific diameter distribution of the stand. In the context of VSS, a stand is defined as an area of trees possessing sufficient uniformity (species composition, age, and physical features) to be distinguished from trees on adjacent areas. For the purpose of this analysis, if the majority of the stems of a stand are in the 24+ diameter class, the stand is classified as a VSS 6 and the 18 to 24 diameter classes are classified as VSS 5 (Reynolds et al. 1992, pg2). For the Community Tank three scales of analysis, the VSS 5 and VSS 6 distribution of ponderosa pine type, outside goshawk post-fledgling family areas, is the allocation of old growth. The allocation of old growth “will consist of landscape percentages meeting old growth conditions and not specific acres” (pg32) across each scale.

According to the Forest plan, Table 15 Old Growth Characteristics, elements of old-growth such as snags, down logs, canopy closure, etc, need to be allocated on 20% of the EMA. Therefore old growth conditions need to be managed at or toward the levels specified in the table within 20% of the EMA.

Direct and Indirect Effects for Old Growth

Old Growth Alternative 1 – No Action

The assessment area would have no treatment thus leaving the designated ponderosa pine stands with no treatment. The no action alternative would contribute to the homogeneity on the landscape and would not increase the diversity of ponderosa pine stand structure across the landscape. Maintaining the homogeneity of current ponderosa pine structure and function across the landscape also contributes to the abnormal conditions in which vegetative species might have not evolved and adapted to genetically. Catastrophic fire threatens the landscape with such low levels of spatial and structural diversity in which places remnant old trees, VSS 5s and 6s on the landscape at risk. “Old trees may be particularly important in a forest, as they have survived centuries of changing environmental and biotic challenges. . . The presence of these trees in a landscape is critical for contributing both seeds and pollen to later generations of trees” (Binkley et. al 2007). This alternative would have no direct effect of change to the ponderosa pine type at the geographic area scale, ecosystem management area scale and the project area scale but would contribute to multiple indirect effects. Landscape diversity, genetic diversity, insect response, and risk of catastrophic fire would be indirectly negatively affected with no action.

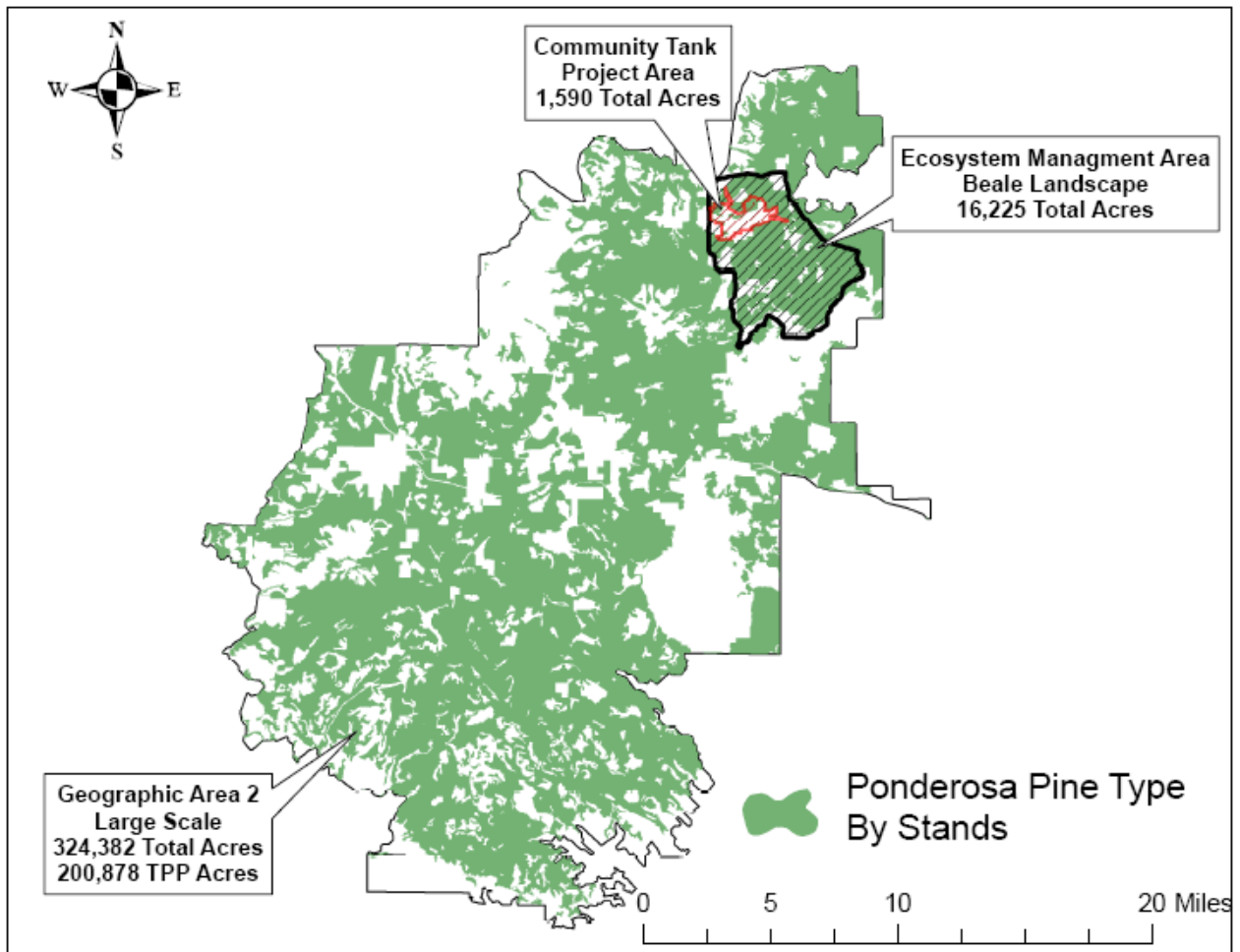


Figure 7. Old Growth, 3 Scales Map: Spatial Distribution and Orientation of the GA 2 Related to Ponderosa Pine Stands

Old Growth Alternative 2 – Proposed Action

The trees left in the vegetative treatment area would be retained spatially to the historic stump patterns on the landscape. This historic representation would provide what the stands would have looked like, spatially, in the Community Tank assessment area during pre-settlement times. Even though pre-settlement evidences are a “snap shot” in time, cutting to the stump patterns brings the area back to its natural range of variability in which the area once evolved to prior to European settlement. Even though these areas won’t be managed at the old growth levels due to the site specific plan amendment, these areas will be restored to its natural range of variation. The site specific plan amendment, to change the designation of the sites to critical wildlife habitat, would change the management of the 800 acres to grassland habitat management, therefore excluding VSS 6 old growth allocation from the landscape percentages. The percent of allocated old growth within the EMA would increase. The required allocation of old growth, from the forest plan, within the EMA is 20 percent.

Old Growth Mid-Scale (Ecosystem Management Area)

The results in table 4 describe the mid-scale VSS structures for the ecosystem management area (EMA). The table expresses the old growth allocations of VSS 5s and VSS 6s collectively are slightly above the 20% for pre (23.18%) and post (24.31%) treatment. These percentages of the VSS 5 and 6 are allocated old growth, even though they do not precisely meet the levels of old growth characteristics listed in the forest plan, at the EMA level. Even though the EMA old growth characteristics such as: trees per acre,

basal area, canopy cover, age, snags, and logs in table 4 are not at the specific levels before and after treatment, the treatment promotes conditions moving toward the forest plan desired levels.

Old Growth Small Scale (Project Area)

The 540 acres of ponderosa pine type that is prescribed burn only, within the project area, would maintain the allocated amount of VSS 5 and 6 specified in the forest plan. This would count as the only allocated old growth within the community tank project. At the project area level, the only allocation of old growth amounts to 15 percent of the community tank project area. Because this estimate includes the site specific plan amended and grassland areas, the percentage of allocated old growth is reduced at the project area level.

Even though “forested sites should meet or exceed structural attributes (pg. 33)” depicted in the old growth characteristic table within the forest plan, at the project area scale, old growth attributes (table 4) would be lower than current conditions due to the site specific plan amendment to promote critical wildlife habitat for grassland species. This level is lower because there is less allocated old growth representing the project area. However, through time the areas in the prescribe burn only areas would most likely meet the levels within the plan because of the management areas outside of goshawk post-fledgling family areas manage for 20% VSS5s and 20% VSS6s. The over representation would bring the average over the 20% requirement. Compared to the Old Growth Characteristic Table within the Forest plan, the old growth characteristics in the Project area, such as: trees per acre, basal area, canopy cover, age, snags, and logs in table 4, are moving toward the conditions specified in the forest plan.

Old Growth Large Scale (Geographic Area)

The geographic area (GA) is approximately 324,558 acres in size. The ponderosa pine type within the GA, delineated by stands, is approximately 200,878 acres. The ponderosa pine type encompasses 62% of the GA. By analyzing the ponderosa pine type as areas outside of goshawk post-fledgling family areas, the 20% VSS 5 mature forest and 20% VSS 6 old forest, which the forest plan emphasis under goshawk management, would amount to 24% of the GA. All pine stands in this analysis were analyzed as areas outside of goshawk post-fledgling family areas because it is known that there are more “de facto allocations of old growth such as goshawk nest sites, mexican spotted owl protected activity centers, sites protected for species behavior associated with old growth, wilderness, research natural areas, and other forest structures managed for old growth function (Forest Plan pg. 32-33)” within the GA.

Therefore the percent of old growth based on the bare minimum allocations exceed the requirement for potential and existing old growth at this level for this GA. This GA is fortunate to have extra potential allocated old growth to mitigate unforeseeable events such as wildfire. Old Growth Characteristics would be similar to the EMA based on similarity of management throughout the GA. “All of the land within a given GA is managed under the same emphasis to ensure consistency, efficiency and integration of the management practices across the GA (pg16)”.

WILDLIFE

Affected Environment

A historic vegetation map identifies the Community Tank project area as "open grassland" (Meekham 1914). Stand exams and observational surveys in the project area by Kaibab National Forest silviculturists corroborate that historic pine densities were low and characteristic of grassland and pine savanna. Density of historic ponderosa pine tree evidence (fallen trees, stumps, and older standing live and dead trees) in the project area ranges from none throughout much of the project area to about 2 trees/acre. Most of the evidence of historic ponderosa pine trees occurs on basalt rock outcrops, with the flatter areas that dominate much of the project area devoid of evidence of presettlement trees.

Most of the project area is flat to gently sloped. Elevations range from about 7,100 to 7,400 feet. Moritz Ride, which reaches an elevation of 7,656 feet, is located on the north side of the project area. The project area covers 1,590 acres, 1,330 acres of which are classified as ponderosa pine forest in the Kaibab National Forest GIS database and the remaining 260 acres classified as grassland (see Table 5). Average tree density in the ponderosa pine stands is 68 trees/acre with a range of 16 to 163 trees/acre. Most of the ponderosa pine trees in the project area range from 12 to 18 inches diameter at breast height (dbh); maximum size of trees surveyed was 27 inches dbh. Most trees are 60 to 80 years old. Understory vegetation cover, which is dominated by blue grama and other grass species and forbs, is sparse where forest structure is relatively dense and greater in forest openings.

Table 5. Acres of vegetation cover types on Forest Service lands within the Community Tank project area, Williams Ranger District, and Kaibab NF. Data source is the Kaibab NF existing vegetation GIS layer.

Vegetation Cover Type	Acres of Cover Type Within		
	Project Area	Williams District	Kaibab NF
ponderosa pine forest	1,330	216,640	480,390
grassland	260	37,550	170,880

There are no perennial streams or wetlands within the project area. Three earthen-dam tanks constructed for livestock occur in the project area: Community Tank, Horse Tank, and Section Ten Tank. Spring Valley Wash is located just west of the project area, and 3 ephemeral water bodies (Fry Lake, Moritz Lake, and Raymond Lake) are located within 2 miles of the project area (Figure 8).

Direct and Indirect Effects on Wildlife

Alternative 1 – No Action

Under the no action alternative, the density and canopy cover of ponderosa pine would continue to increase throughout the project area. Forest openings and grassland areas would continue to decrease in size. Similar changes have been occurring in montane grasslands and ponderosa pine forests across the Williams District and ponderosa pine forests throughout the Southwest. Prior to the introduction of large numbers of livestock in the late 1800s, a well developed layer of grasses and forbs provided a widespread and continuous fine fuels layer, and low-intensity surface fires burned frequently. Those frequent surface fires decreased dramatically beginning in the late 1800s in grasslands and ponderosa pine forests throughout much of the Southwest (Swetnam et al. 1999). Fire suppression practices since the early 1900s have contributed to reduced wildfire frequency and extent. As a result of reduced wildfire that historically thinned young ponderosa pine trees, montane grasslands have been invaded by ponderosa pines and junipers, and ponderosa pine forests have become increasingly dense (Swetnam et al. 1999, Covington and Moore 1994, Covington 2003). Historic logging in the late 1800s and early 1900s resulted in widespread removal of large old trees. The ecological ramifications of these changes are significant and include (Covington and Moore 1994, Allen et al. 2002, Covington 2003):

- a fire regime that has changed from frequent, low-severity surface fires to less frequent but high-severity crown fire;
- a forest structure that historically was relatively open and dominated by large old trees, but is now dominated by dense stands of smaller-diameter trees;
- understory grasses and forbs have decreased in abundance and diversity;
- stands that are increasingly susceptible to insect outbreaks and disease because trees in dense stands have less vigor and resistance to insect and disease attacks;
- decreased subsurface and surface water availability as a result of increased interception and evapotranspiration in the dense pine stands.

These changes in forest structure, composition, and ecological processes have important implications for wildlife and wildlife habitat. High-severity crown fire completely alters forest structure, and these changes are outside of the historic range of variability under which all native wildlife species in southwestern ponderosa pine forests evolved and are adapted to (Swetnam 1999, Covington 2003). High-severity crown fire is considered to be the greatest current threat to Mexican spotted owls, and is certainly also a threat to habitat of northern goshawks and numerous other wildlife species. Significantly reduced herbaceous and shrub layers results in decreased forage and cover for numerous species of animals. Decreased subsurface and surface water availability has significant implications for numerous animal species existing in the dry forest habitats that characterize this region. Some of these changes such as increased frequency of high-severity crown fires and decreasing water availability are likely even more significant going into the future because climate change is expected to result in increasingly dry conditions, drought, and increasing numbers of wildfires in the Southwest (Fule 2008).

Alternative 2 – Proposed Action

General Effects of Treatments on Wildlife Habitat: The two main types of treatments under the proposed action would be thinning and prescribed fire. Thinning treatments would involve chainsaw hand crews or mechanical thinning. Feller bunchers or skid steer loaders with hydraulic clipping shears mounted on front would be used for mechanical thinning. Prescribed fire treatments would include both broadcast burning and pile burning.

Overstory vegetation (tree density, canopy cover, canopy volume) would be greatly reduced by thinning and broadcast burning treatments (broadcast burning results in canopy scorching and a certain level of tree mortality). Direct effects of these changes in forest structure would be greatest for tree-dependent wildlife species such as Abert's squirrels (see Management Indicator Species section) and various forest bird species (see Migratory Birds section).

Understory vegetation would be greatly affected as a result of thinning and burning treatments. There would be short-term decreases but longer-term increases in cover and biomass of herbaceous plants following thinning and broadcast burning (Moore and Deiter 1992, Korb and Springer 2003, Abella 2009). Species composition of herbaceous plants would change, and the total number of herbaceous plant species would likely increase (Korb and Springer 2003, Abella 2009). Shrub cover also would likely increase. Grasses, forbs, and shrubs provide food and cover resources for numerous wildlife species, so these changes in understory vegetation would greatly affect habitat for many species of invertebrates, reptiles, birds, and mammals.

Forest floor structure and processes would be greatly affected by the proposed action. Broadcast burning would result in reduced biomass of litter, small woody material, and logs. Organic matter on the forest floor provides important habitat for a wide variety of invertebrate and vertebrate animal species, and logs provide key habitat elements for numerous wildlife species, especially lizards, snakes, and small mammals in ponderosa pine forests (Chambers and Germaine 2003).

Species Listed Under the Endangered Species Act: All animal species identified for Coconino County, Arizona by the U.S. Fish and Wildlife Service was evaluated (<http://www.fws.gov/arizonaes/>). This list includes species classified as Candidate or Proposed and species with conservation agreements. The Williams Ranger District is outside of the known range or lacks suitable habitat for all animal species on this list except California condor and Mexican spotted owl. The project area is within the experimental nonessential population area designated for the reintroduced California condor, but reintroduced condors in Arizona primarily occur at the Grand Canyon, Kaibab Plateau, and Vermillion Cliffs area. They have not been coming down as far south as the Williams District, so the proposed action would not affect condors.

The **Mexican spotted owl** is listed as Threatened under the Endangered Species Act. Mexican spotted owls occur on the Williams District, but there is no spotted owl habitat within the Community Tank project area (Figure 8). The project area is located between Mexican spotted owl Critical Habitat Units UGM-15 and UGM-17. The project area boundary is located 1.1 miles from the Pumpkin Protected Activity Center (PAC) boundary, 1.8 miles from the Kendrick PAC boundary, and 2.6 miles from the Sitgreaves PAC boundary UGM-17.

An indirect effect of the proposed action would be a reduction in the risk of high-severity crown fire impacting spotted owl habitat around Kendrick Mountain. High-severity wildfire is considered to be the primary risk to Mexican spotted owls in the Southwest. Prevailing winds in the vicinity of the project area are out of the southwest, and Kendrick Mountain is located nearby and to the northeast (Figure 8). Much of the mixed conifer spotted owl habitat on Kendrick Mountain burned during the 2000 Pumpkin Fire. Spotted owls however still occur on the south side of the mountain in forest habitat that escaped high-severity crown fire. Much of the area between the project area and Kendrick Mountain is dominated by relatively dense ponderosa pine forest characterized by high fuel loads and the potential for rapidly moving crown fire (Figure 8).

Most but not all of the prescribed burning would occur during the fall, outside of the spotted owl breeding season (March 1 to August 31). If conditions allow, fire managers may conduct limited spring burning, which would overlap the spotted owl breeding season. Smoke from pile burning and broadcast burning treatments may affect spotted owls on the south side of Kendrick Mountain but would not adversely affect owls because smoke would not settle on the slopes of Kendrick Mountain so any potential smoke effects would be short-term.

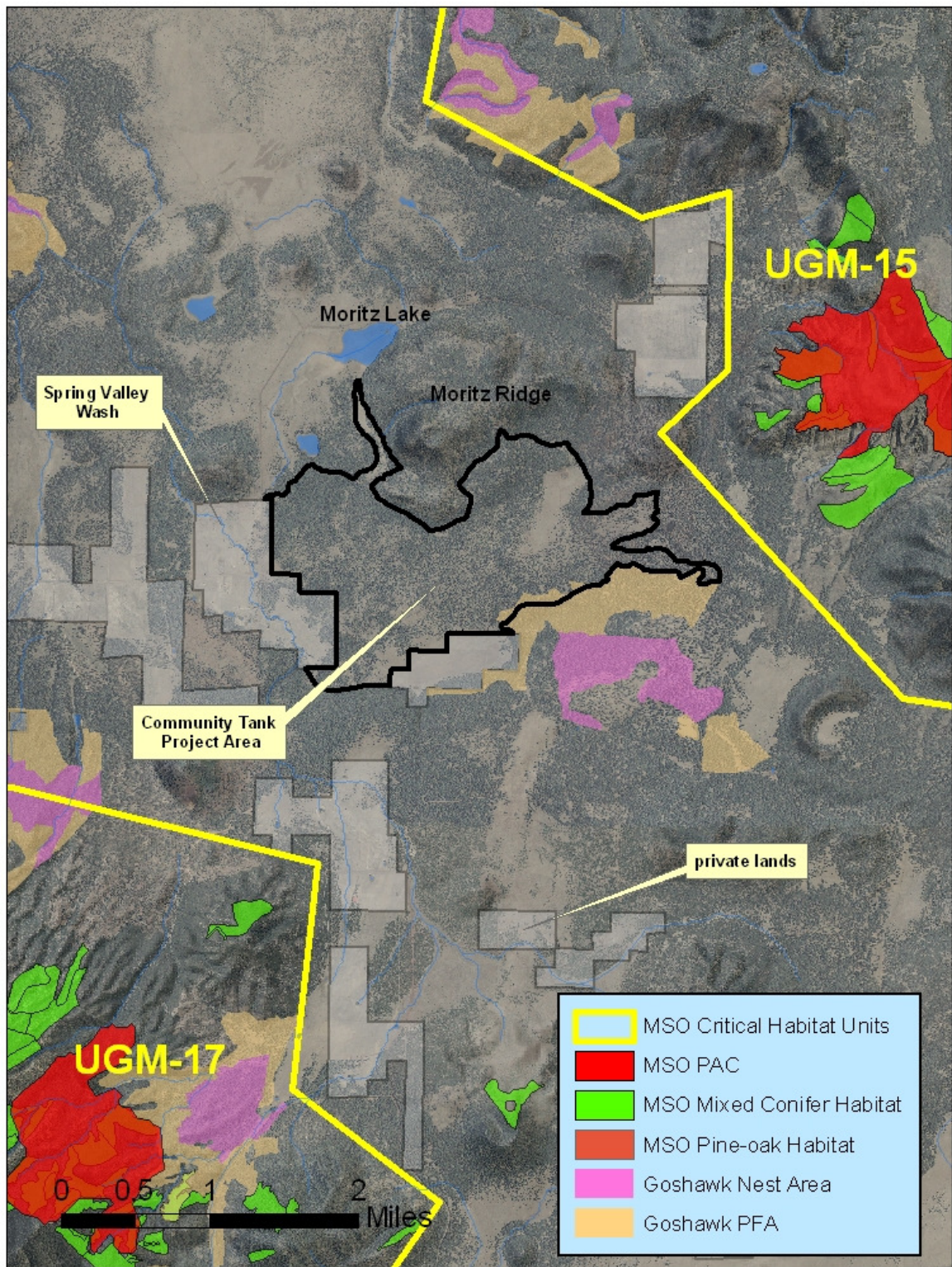


Figure 8. Community Tank project area, Mexican spotted owl (MSO) habitat, and goshawk management areas.

Forest Service Sensitive Species: Animal species from the 2007 Southwestern Region (R3) Forest Service Sensitive species whose range overlaps the Williams Ranger District and the district contains suitable habitat are northern leopard frog, bald eagle, burrowing owl, peregrine falcon, Merriam's shrew, spotted bat, Allen's lappet-browed bat, Townsend's big-eared bat, and Mogollon vole.

There would be no effects of the proposed action on **northern leopard frog** because there is no suitable aquatic habitat in the analysis area.

The **bald eagle** was taken off the Endangered Species List in 2007, but the Southwestern Region of the Forest Service classifies it as a Sensitive species. The project area is outside of the range of the Sonoran Desert population of bald eagles in central Arizona. Migratory bald eagles occur on the Williams District during winter months, and immature bald eagles have been observed during spring and summer months near water bodies stocked with fish such as Kaibab Lake, Dogtown Reservoir, and White Horse Lake. No bald eagle nests have been documented on the Williams District so these may be immature eagles from nests located in central Arizona (http://www.azgfd.gov/w_c/edits/documents/Halileuc.di.pdf). The Williams District has no records of bald eagle occurrences in the project area. Primary prey of bald eagles on the Williams District includes fish, waterfowl, carrion, and small mammals. The proposed action would not affect availability of fish, waterfowl, or carrion, but would affect habitat for small mammals. Small mammal prey in Arizona includes jackrabbits, cottontails, squirrels, and woodrats (http://www.azgfd.gov/w_c/edits/documents/Halileuc.di.pdf). Increased growth of herbaceous plants and shrubs following thinning and broadcast burning treatments (see General Effects of Treatments on Wildlife Habitat) may benefit species such as jackrabbits, cottontails, ground squirrels, and woodrats. Increased growth of herbaceous plants and shrubs would provide increased forage and cover for these species. Overall, the proposed action would have little effect on bald eagle habitat and would not adversely affect bald eagles.

Northern goshawks typically nest in large ponderosa pine trees in relatively dense forested areas on the Williams District. Life history, potential management impacts, habitat and population trend data for northern goshawk are summarized on pages 24 to 31 of the 2008 MIS Report (http://www.fs.fed.us/r3/kai/management/efoia/wildlife_mgmt/). Goshawks prey on a wide variety of species. In southwestern ponderosa pine forests, important prey include golden-mantled ground squirrels, cottontail rabbits, Abert's squirrels, rock squirrels, chipmunks, Stellar's jays, and northern flickers, with mammals providing most of the prey biomass (Beier and Maschinski 2003).

The Williams District has traditionally monitored goshawk territory occupancy by conducting surveys of known nest areas (one or more nest sites located in the same general area). There is one known historic goshawk nest area located within the vicinity of but outside of the project area boundary (Figure 8). Goshawk surveys were conducted in the historic nest area and throughout the project area in 2008 and no goshawks were detected. The historic nest area also was surveyed in 2007 but goshawks were not detected. Territory occupancy and reproduction in this nest area was last confirmed in 2004, however, for this analysis we assume this goshawk territory is occupied. A stand polygon designated as goshawk Post-fledging Family Area (PFA) overlaps the southeast project area boundary (Figure 8). Additional goshawk surveys were conducted in the historic nest area during summer of 2009.

Management direction for northern goshawks is found on pages 27 to 31 of the Kaibab National Forest land management plan (<http://www.fs.fed.us/r3/kai/plan-revision/forestplan.shtml>). There would be two types of effects of the proposed action on the northern goshawk: 1) potential effects to individual goshawks due to visual and auditory disturbance effects associated with project implementation, and 2) modification of nesting and foraging habitat. Adverse disturbance effects would be unlikely because

surveys have failed to detect goshawks within the project area. Under the proposed action, approximately 24 acres of forest designated as goshawk PFA would be broadcast burned but not thinned. It is unlikely that low-intensity broadcast burning would negatively affect nesting goshawks because the area that would be burned is located at least 0.3 mile from the historic nest area, and burning within the PFA would be conducted outside of the goshawk breeding period, which is March 1 to September 30.

Because goshawks nest primarily in relatively dense patches of forest, thinning treatments would reduce the amount of potential goshawk nesting habitat. Potential nesting habitat would be reduced throughout much of the 800 acres of ponderosa pine forest cover type that would be thinned under the proposed action. However, much of this area is not currently suitable goshawk nesting habitat because of open (low density) stand conditions and small trees. Because goshawks select relatively dense forest structures for nesting and foraging habitat, forest restoration treatments similar to the Community Tank proposed action are generally not consistent with minimum canopy cover direction in the 1996 R3 Forest Service regional goshawk guidelines (see review by Beier and Maschinski 2003).

A direct effect of thinning treatments would be reduced habitat quantity and quality within of ponderosa pine forest that would be restored. An indirect effect of the proposed action would be a reduction in the long-term risk of high-severity crown fire impacting goshawk habitat in forested areas surrounding the project area. There are four known goshawk nest areas within 2 miles of project area boundaries, two of which are located to the north or northeast (prevailing winds in the vicinity of the project area are out of the southwest).

There are an estimated 216,640 acres of ponderosa pine forest cover type on the Williams District and 480,390 acres on the Kaibab NF (Table 5). Reduced habitat quantity and quality on 800 acres of this cover type in the Community Tank project area would thus impact approximately 0.4% of the area of this cover type on the Williams District and 0.2% of the area of this cover type on the Forest. Although the proposed action would negatively affect goshawk habitat, the scale of the effect would be insufficient to affect habitat or population trend or population status for the northern goshawk at the spatial scale of the Williams District or Kaibab NF.

There are 260 acres of grassland cover type within the project area, and this cover type could be considered potential habitat for **burrowing owl**. This species has not been detected on project surveys, and there are no known burrowing owl detections on the Williams District, so it is unlikely that this species occurs within the project area. Thinning and burning treatments would result in an increase in the amount of potential burrowing owl habitat.

Peregrine falcons have been documented nesting on Sitgreaves Mountain, approximately 3 miles southwest of the analysis area. The analysis area contains no potential nesting habitat (cliffs or prominent rock outcrops) but does contain potential foraging habitat. Peregrine falcons typically hunt avian prey in open habitats. The proposed action would not adversely affect peregrine falcons and would result in an increase in the amount of potential open foraging habitat.

The project area is located within the range of **spotted bat**, **Allen's lappet-browed bat**, and **Townsend's big-eared bat** and contains suitable foraging habitat for each. These bat species frequently forage on flying insects over and near water bodies. There are no perennial water bodies within the project area, only ephemeral drainages that rarely contain water and earthen-dam tanks. Spring Valley Wash is located just west of the project area. The proposed action would not affect roosting habitat for spotted bats because this species roosts in crevices and cracks in cliff faces and rock outcrops, and these habitat features are not found in the project area. Townsend's big-eared bats roost in caves, mines, and buildings, and these habitat features do not occur in the project area.

Potential roosting habitat for Allen's lappet-browed bat does occur in the project area because this species is known to roost behind pieces of loose bark in large, old ponderosa pine trees and snags. Most of the 60-80 year-old ponderosa pines in the project area probably do not currently function as suitable roosting habitat because they are not old enough to have developed suitable roost-site characteristics. Existing snags would not be harvested under the proposed action unless they present safety or fuels hazards. Thinning treatments under the proposed action, however, would result in short-term and long-term reduction in roost-site availability for Allen's lappet-browed bat compared to the No Action Alternative. Potential effects to insect prey abundance and foraging habitat for Allen's lappet-browed bat and other bat species are less clear.

Restoration in 800 acres of the ponderosa pine cover type in the Community Tank project would impact approximately 0.4% of the total area of this cover type at the scale of the Williams District and 0.2% at the scale of the Kaibab NF (Table 5). Thus, the proposed action would negatively affect Allen's lappet-browed roosting habitat, but the scale of the effect would be insufficient to affect habitat or population trend or population status of this species at the spatial scale of the Kaibab NF. Similarly, potential effects would likely be insufficient to affect habitat or population trend or population status of spotted bats or Townsend's big-eared bats at the spatial scale of the Kaibab NF.

The project area is located within the range of **Merriam's shrew** and **Mogollon vole** and contains suitable habitat for each. Each of these two species depends on the herbaceous vegetation layer for cover and food resources (Merriam's shrews eat plant-dependent arthropods, Mogollon voles forage on grasses and forbs). Effects of the proposed action would be 1) short-term reductions in herbaceous vegetation due to broadcast burning and mechanical disturbance; 2) longer-term (beginning 1-3 years post treatment) increases in herbaceous vegetation (see General Effects of Treatments on Wildlife Habitat); and 3) possibility of incidental mortality of individual shrews or voles due to heavy equipment use and burning treatments. Possibility of incidental mortality would be low because each of these species can escape into underground burrows. The proposed action would not likely result in a population decline of Merriam's shrew or Mogollon vole because of the longer-term increases in herbaceous cover and food resources that would occur following treatment and the small spatial scale of habitat impacts relative to the amount of ponderosa pine cover type at the scale of the Williams District or Kaibab NF (Table 5).

Management Indicator Species: Management Indicator Species and the habitats they represent are listed in the most recent Kaibab NF Management Indicator Species (MIS) report ([Forest Service 2008](#)). Information on species biology, management effects, population trends, and habitat trends are summarized in this most recent MIS report, and this information will not be duplicated here. The project area has suitable habitat for the following Management Indicator Species: northern goshawk, hairy woodpecker, pygmy nuthatch, wild turkey, elk, mule deer, pronghorn, and Abert's squirrel. Potential impacts of the proposed action on Management Indicator Species were evaluated by describing effects to each species' habitat types. The amount of habitat within the project area for each indicator species was estimated using a GIS analysis of vegetation cover types. Vegetation cover types mapped within the Community Tank project area are ponderosa pine forest and grassland (Table 5).

Northern goshawk was discussed above in the Forest Service Sensitive species section and on pages 26 to 33 of the 2008 MIS Report.

Hairy woodpecker and **pygmy nuthatch** are two of the most common bird species found in ponderosa pine forests on the Williams District. Hairy woodpecker is an indicator for snags in ponderosa pine, mixed conifer, and spruce-fir forest types (Forest Service 2008: pages 33-39), and pygmy nuthatch is an indicator for and primarily occurs in late-seral ponderosa pine forest (Forest Service 2008: pages 52-56). Both species nest in cavities and forage on arthropods in trees (hairy woodpeckers excavate their nest cavities and pygmy nuthatches primarily use existing cavities). Cavities are more common in snags and

dead portions of live trees. Snags and trees with dead tops or lightning scars would not be cut under the proposed action unless they create a safety or fire hazard. However, reduced forest cover due to thinning and maintenance broadcast burning treatments would likely result in short- and long-term reduction in population density for each of these bird species within the project area due to reduced foraging and nesting habitat. Reduced density of hairy woodpeckers and pygmy nuthatches within the Community Tank project area would be unlikely to affect population trend or population status for either of these species at the spatial scale of the Kaibab NF because the 800 acres of ponderosa pine forest that would be thinned represents only about 0.2% of the Forest total for this cover type (Table 5).

Wild turkey is an indicator of late-seral ponderosa pine forest (Forest Service 2008: pages 62-64). Turkeys nest on the ground and forage on a wide variety of plant and arthropod food sources on the forest floor. Turkeys typically roost in the canopies of large-diameter pines on the Williams District, so thinning would result in decreased roosting habitat. Thinning and broadcast burning would result in increased growth of grasses, forbs, and shrubs, which would result in increased cover and food resources for turkeys. Although herbaceous vegetation cover would likely increase within 1-3 years of project implementation, initial effects of broadcast burning would be a decrease in herbaceous vegetation. Because turkeys are ground nesters, the short-term effect of broadcast burning and mechanical disturbance would be decreased potential nest cover. If broadcast burning is conducted during the spring, there would also be a possibility of incidental mortality of turkey eggs or chicks. Turkeys begin nesting in late April to early May and incubation lasts 28 days (Corman and Wise-Gervais 2005: page 80). Most but not all of the broadcast burning would occur in the fall.

The proposed action would not likely result in reduced population density of turkeys within the project area because of the longer-term increases in cover and food resources likely to occur following treatments. The proposed action would not likely affect habitat or population trend for this species at the spatial scale of the Kaibab NF because the 800 acres of ponderosa pine forest that would be thinned represents only about 0.2% of the Forest total for this cover type (Table 5).

Elk and mule deer are popular big game species as well as Management Indicator Species on the Kaibab NF. Elk is an indicator for early-seral ponderosa pine, mixed conifer, and spruce-fir habitat (Forest Service 2008: pages 75-77), and mule deer is an indicator for early-seral aspen and pinyon-juniper habitats (Forest Service 2008: pages 77-80). The proposed action would likely result in increased habitat quality for each of these two species because thinning and broadcast burning treatments would result in substantial increases in forage (grasses and forbs) and browse (shrubs) for elk and mule deer within the 800 acres of ponderosa pine cover type. Increased habitat quality due to increases in forage and browse availability would be offset to some degree by decreased thermal and hiding cover that would result from thinning and burning treatments. The spatial scale of the project would be too small to affect habitat or population trend of either species at the scale of the Kaibab NF (Table 5).

Pronghorn antelope (American pronghorn) is an indicator of grassland habitats on the Kaibab NF (Forest Service 2008: pages 81-85). A radio telemetry study conducted by AGFD during the 1990s showed that pronghorns moved through the Community Tank area on a migration route between summer range around Bellemont and A-1 Mountain and winter range to the north around Red Butte. Pronghorns are commonly seen around Moritz Lake, just north of the Community Tank project area, and in Government Prairie several miles south of the project area. This is a true grassland species, so the proposed action would result in improved habitat quality and quantity. Thinning and broadcast burning would result in substantial increases in forage and browse for pronghorns within the project area. Fence removal and modification under the proposed action also would facilitate pronghorn movement and thus result in increased pronghorn habitat quality. A potential short-term negative effect on pronghorn habitat is possible if activity slash is excessive and impedes pronghorn movement through the area. The proposed action is designed to minimize activity slash by using commercial tree removal where possible,

lopping and scattering, piling and burning, and broadcast burning. The spatial scale of the project would be too small to affect habitat or population trend for pronghorn at the scale of the Kaibab NF (Table 5).

Abert's squirrel is an indicator of and primarily found in ponderosa pine forest (Forest Service 2008: pages 87-91). This species is common in ponderosa pine forest across the Williams District. It builds nests in the canopies of large-diameter ponderosa pine trees and feeds on pine cone seeds, pine twigs and buds, fungi, and other foods. Thinning and broadcast burning would result in reduced foraging and nesting habitat for Abert's squirrel, so the proposed action would likely result in short- and long-term reduction in population density for this species within the 800 acres of ponderosa pine cover type that would be treated. Reduced density within the Community Tank project area would be unlikely to affect habitat or population trend or population status for Abert's squirrel at the spatial scale of the Kaibab NF because the 800 acres of ponderosa pine forest represents only about 0.2% of the Forest total for this cover type (Table 5).

Migratory Birds and Other Wildlife Species Potentially Affected: Potential effects to migratory birds and other wildlife species were considered. Effects to northern goshawk, hairy woodpecker, pygmy nuthatch, and wild turkey were described in the Forest Sensitive Species and Management Indicator Species sections above. Some of the effects described above for these species would be similar for other bird species with similar habitat associations that occur in the Community Tank project area. The proposed action would result in reduced habitat for a variety of bird species common in denser ponderosa pine forest habitats on the Williams District such as mountain chickadee, brown creeper, golden-crowned kinglet, yellow-rumped warbler, Grace's warbler, and red crossbill.

We also considered potential effects of the proposed action on birds identified as Priority Species (species of concern) by Arizona Partners in Flight (PIF). Arizona PIF identifies Priority Species by habitat type (http://www.azgfd.gov/pdfs/w_c/partners_flight/APIF%20Conservation%20Plan.1999.Final.pdf). Arizona PIF Priority Species identified for pine habitat are northern goshawk, olive-sided flycatcher, Cordilleran flycatcher, and purple martin. Olive-sided flycatchers and purple martins occur in ponderosa pine forest similar to that found in parts of the Community Tank project area elsewhere on the Williams District, so it is assumed that each potentially occurs in the project area. Cordilleran flycatchers are more likely to occur in ponderosa pine-Gambel oak stands than in pure ponderosa pine stands in northern Arizona (Rosenstock 1998). Ponderosa pine stands in the Community Tank project area lack Gambel oak and the denser understory that this species typically selects. If Cordilleran flycatchers occur in the project area, their density is likely very low. Olive-sided flycatchers typically select forested habitats with openings and tall snags from which to forage. They do not typically occur in dense forest structures without openings. The proposed action would not likely adversely affect habitat for this species because thinning and broadcast burning treatments would result in more openings, and snags would not be cut unless they pose a safety risk. Purple martins have not been detected in the project area. They typically occur near wetlands with standing water on the Williams District. Because this species is associated with open habitats, the proposed action would not likely adversely affect habitat for pine martins and may result in improved habitat conditions.

PIF Priority Species for high elevation grassland habitats are ferruginous hawk, Swainson's hawk, burrowing owl, and grasshopper sparrow. None of these four species is likely to breed in the project area (Corman and Wise-Gervais 2005) and none was detected during field surveys. Bird species commonly detected in nearby grassland and open pine habitats (Government Prairie and Garland Prairie) include vesper sparrow, horned lark, northern harrier, northern mockingbird, lark sparrow, savanna sparrow, western meadowlark, barn swallow, and barn owl. In addition to these bird species, mammals other than pronghorn that are associated with grasslands on the Williams District include spotted ground squirrel, Gunnison's prairie dog, and American badger. The proposed action would result in an increase in habitat quantity and quality for these and other species associated with grasslands and open pine habitats.

In addition to the types of habitat effects described above, thinning, broadcast burning, and heavy equipment use (dozers, feller bunchers, and agra-axes) could result in incidental mortality for certain bird species, as well as certain reptiles (lizards and snakes) and small mammals. Most of nesting activity for bird species that occur on the Williams District occurs in April, May, June, and July (Corman and Wise-Gervais 2005). Thinning, broadcast burning, and heavy equipment use during these months would likely result in some level of incidental mortality of eggs and nestlings of birds, especially for birds that nest on the ground or understory, but the level of incidental mortality would be insufficient to cause any adverse population effects because of the limited spatial scale of the project.

Other vertebrate species were considered, but no species whose population status would potentially be threatened by the proposed action was identified. Animal species with small populations and a geographic range that overlaps the project area would be species whose population status may be impacted by the proposed action. No such species were identified (Hoffmeister 1986, Sibley 2003, Corman and Wise-Gervais 2005, Brennard and Holycross 2006).

Cumulative Effects of Proposed Action

The temporal and spatial scale of the cumulative effects analysis was the same as those used in the Overstory Vegetation section. The timeframe for this analysis covers the period from about 15 years ago to 10 years into the future. The area covers approximately 213,000 acres north of Interstate 40, west of the Kaibab National Forest/Coconino National Forest boundary, east of State Route 64, and south of the northern Williams District boundary. Several thinning projects are currently under contract as timber sales within the cumulative effects analysis area. These timber sales are in ponderosa pine forest. The RS East timber sale is 514 acres, 425 of which have been cut. The Wright Hill timber sale is 761 acres, none of which has been cut yet. The Prairie timber sale is 496 acres, none of which has been cut yet. The Government Hill #1 timber sale is 273 acres, 240 acres of which has been cut. The Government Hill #2 timber sale is about 475 acres, none of which has been cut yet. The Elk Springs timber sale is about 1,080 acres, none of which has been cut yet. Approximately 13,000 acres of thinning treatments have been implemented in the analysis area during the past 15 years (thinning treatments is used to refer to a variety of different silvicultural treatments including thinning from below, noncommercial thinning, group selection cuts, shelterwood cuts, sanitation cuts). Thinning treatments were typically followed with activity slash treatments including lopping and scattering, piling and burning, and broadcast burning.

In addition, approximately 7,600 acres of grassland maintenance treatments have been conducted within the cumulative effects analysis area, primarily within pinyon-juniper woodland and grassland cover types. Most of these acres were treated using agra-axes.

It is estimated that in the next 10 years, approximately 10,000 additional acres of thinning treatments will occur in the ponderosa pine cover type, and approximately 15,000 additional acres of grassland maintenance treatments will occur in pinyon-juniper woodland and grassland types within the cumulative effects analysis area.

Over the past 15 years, 20,125 acres of the cumulative effects analysis area has been broadcast burned. Including the proposed action, 15,190 acres of broadcast burning are planned in the next 10 years within the analysis area. Thus, over the 25-year cumulative effects analysis period, approximately 35,315 acres have been or are planned to be burned. This is approximately 17% of the cumulative effects analysis area. In addition to this prescribed burning, there has been an additional 10,120 acres that have been burned by wildfires. Of this, approximately 3,000 acres had severe wildfire that removed most of the forest canopy.

The proposed action would result in increases in habitat quality and quantity for various wildlife species associated with montane grasslands and open pine habitats on the Williams District (e.g., pronghorn, Gunnison's prairie dog, spotted ground squirrel, badger, and various bird species such as vesper sparrow, horned lark, northern harrier, northern mockingbird, lark sparrow, savanna sparrow, western meadowlark, barn swallow, barn owl). The proposed action would result in decreases in habitat quality and quantity for wildlife species associated with denser ponderosa pine forest habitats (e.g., Abert's squirrel, and various bird species such as northern goshawk, hairy woodpecker, pygmy nuthatch, white-breasted nuthatch, mountain chickadee, brown creeper, golden-crowned kinglet, yellow-rumped warbler, Grace's warbler, red crossbill). Because direct and indirect effects of the proposed action would be of such limited spatial scale compared to the amount of habitat available (Table 5), the effects of the proposed action in addition to effects from other past, present, and reasonably foreseeable future actions would likely be insufficient to cause a population decline or threaten the population status for any of the species evaluated.

SOILS AND WATERSHED

Affected Environment

Most of the Community Tank Project is located within the Marteen Tank sub-fifth code watershed, in the upper reaches of the Spring Valley 5th code watershed. There are approximately 38,275 and 131,375 acres in these watersheds, respectively. Marteen Tank is entirely within National Forest boundaries; 68,600 acres of the Spring Valley watershed is within National Forest. A small portion of the project area is located within the Miller Wash Watershed 5th code watershed. Both the Spring Valley and Miller Wash watersheds drain into the Havasu Canyon Watershed and then into the Colorado River in the Grand Canyon.

There are no perennial or intermittent streams in the project area. During periods of rapid snowmelt or high intensity rain events, low flow ephemeral streams feed 3 stock tanks. There is little to no water runoff to areas outside the project boundary. The current average erosion rate in the project area is 0.19 tons per acre per year; the rate that can be sustained without incurring long term loss of soil sustainability is 2.30 tons per acre per year. Watershed conditions are satisfactory throughout the project area. Current erosion rates are well below the sustainable threshold.

The Terrestrial Ecosystem Survey (USDA Forest Service, 1991) identifies 11 different map units within the project area. The majority of the area contains grassland and savanna soil types. Map units 519 and 537 occupy approximately 67% of the project's 1620 acres. Both of these soils formed in place from basaltic parent materials and are predominantly gravelly to cobbly clay loams. Map Unit 519 is shallow, with high rock fragment content. Map Unit 537 is moderately deep. The entire project area is covered by soils that have low bearing strength when wet. These soils are easily compacted by vehicle traffic.

None of the Terrestrial Ecosystem Maps Units (TES Units) in the area have a high risk of sheet or rill soil erosion. This is largely due to the absence of steep slopes. Rock and litter cover are generally in the 75% - 80% range, which also contributes to low current erosion rates. Low-lying grasslands (TES Units 0006 and 0037) have some vulnerability to gully erosion if they are subjected to extreme runoff events. They are also subject to seasonal flooding and have areas of wetland soils.

Direct and Indirect Effects on Soils and Watershed Values

Alternative 1 – No Action

There would be no risk of soil compaction due to off-road equipment use during wet periods.

As the trees grew denser, the risk of high-intensity wildfire would increase. Should such fire occur, soil productivity could be severely impaired for several years. While the area has a low risk of soil loss due to water erosion, if the majority of the vegetative cover was burned, wind erosion could remove topsoil. Further tree encroachment in grasslands can reduce understory plant cover over the long term. Loss of plant cover can lead to a decrease in soil organic matter. Soil organic matter is important not only for maintaining soil fertility, but also for maintaining soil structure, stability, and infiltration capacity.

Alternative 2 – Proposed Action

Burning will remove some vegetative cover, litter, duff, and woody debris from the soil surface. The burn will produce a mosaic of fire intensities, but most areas will burn at a low intensity. The burning will create a scattering of small areas of bare soil; however, most of the burned area will retain sufficient litter and live vegetative cover to prevent unsustainable soil erosion from either water or wind. Any increase in runoff or erosion from the bare patches will only occur during the first two years, due to the quick recovery of herbaceous vegetation. The prescribed burning will have negligible effects on watershed condition or soil productivity in the long term.

Grassland restoration involves removing most of the tree canopy. Herbaceous species will benefit from this as their access to light, space, moisture, and nutrients will be greatly enhanced. The increase in understory cover and productivity will provide long term soil and watershed protection. Areas with the densest tree cover currently have very little herbaceous vegetation, but do have thick litter cover. It may take longer for herbaceous cover to establish here because of the sparse seed bank. Mitigation measures will be used to encourage re-growth by regulating livestock grazing.

Project activities will not cause excessive soil compaction, ruts, or erosion because vehicles and heavy equipment will not be used in the project area when soils are wet.

Cumulative Effects on Soils and Watershed Values

The cumulative effects analysis area is the Marteen Tank sub5 watershed, which covers the upper 38,275 acres of the Spring Valley 5th code watershed. The proposed project area is located in the western, lower half of the analysis area. The cumulative effects analysis period is 2004 through 2014, in order to include projects with impacts that could overlap the impacts of the proposed action. Projects planned and implemented since 1991 have included Best Management Practices that limit soil and watershed impacts and are intended to correct any measurable impacts within three to four years after project completion.

Projects and activities that may contribute to cumulative effects are: Government Hill timber sale (2008), RS Hill timber sale (2007), Spring Valley 1 and 5 timber sales (2007 and 2009), Marteen prescribed burns (annually), Kendrick-Newman prescribed burns (2002-2006), Government Prairie prescribed burns (annually), and livestock grazing on Government Mountain Allotment (ongoing).

The average current erosion rate in the Marteen Tank sub5 watershed is 0.70 tons per acre per year. Additional erosion from projects during the analysis period varies the average rate from 0.75 tons per acre per year in 2010 and 2011 to 0.78 tons per acre per year in 2006. In 2009, the year Community Tank is expected to be implemented, the cumulative average soil loss rate is predicted to be 0.77 tons per acre per year. The actual predicted increase due specifically to Community Tank is from 0.7675 to 0.7718 t/a/y. The Marteen Tank sub5 watershed can tolerate up to an average of 2.7 tons of soil loss per acres per year before it experiences long term loss of soil sustainability. Because other projects in the watershed have

not caused a significant trend toward watershed impairment and because Community Tank contributes a very negligible amount to the cumulative total, there are no meaningful negative cumulative soil or watershed impacts due to implementation of the proposed project.

RARE PLANTS

Affected Environment

The proposed project area is composed primarily of grasslands and pine-oak forest. There is a small amount of ponderosa pine forest. Soils in the project area were formed mostly from basalt rock materials.

A review was conducted to determine if any Threatened, Endangered, Candidate, Conservation Agreement, or Forest Service Sensitive plant species and/or habitats were known to occur in the Community Tank Grassland Restoration Project Area. The following references were used: USFWS Internet list of Threatened, Endangered, Candidate, and Conservation Agreement species occurring in Coconino County; USDA Forest Service Region 3 Sensitive Species List; Arizona Game and Fish Department Heritage Data Management System; NatureServe Explorer Internet site; and Arizona Rare Plant Field Guide.

No suitable habitat for Threatened, Endangered, Candidate, or Conservation Agreement species exists within the Community Tank Project Area. Suitable habitat does exist in the project area for these Forest Service Sensitive Plants: Mt. Dellenbaugh sandwort and Rusby milkvetch (see Table 6). These two species will be addressed in the effects analysis.

Table 6. USDA Forest Service Southwestern Region List of Sensitive Plants that May Occur On or Near the Community Tank Grassland Restoration Project Area

Common Name (Scientific Name)	Elevation, Habitat, and Range
Mt. Dellenbaugh sandwort (<i>Arenaria aberrans</i>)	5500-9000'. Found N of Williams, at the South Rim of Grand Canyon National Park, and in De Motte Park on the N Kaibab RD. Basalt soil or sandy soils. Meadows and meadow edges within oak and pine forests or in pinyon-juniper woodlands.
Rusby milkvetch (<i>Astragalus rusbyi</i>)	5400-9000'. Found on the lower slopes of the San Francisco Peaks, in Oak Creek Canyon, N of Williams, Kendrick Peak, Garland Prairie, and Camp Navajo. Dry or temporarily moist basaltic soils. Openings or meadows in ponderosa pine forest or at the edge of thickets and aspen groves. Also found in mixed conifer and pine-oak forests in openings.

Sensitive species are defined as “those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by: a) significant current or predicted downward trends in population numbers or density; or b) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution” [FSM 2670.5(19)]”.

A search was conducted in the Heritage Data Management System maps of plant species occurrences, the Kaibab National Forest GIS rare plant occurrence layers, and in the Kaibab National Forest rare plant files.

No Threatened, Endangered, Candidate, Conservation Agreement, or Forest Service Sensitive plant species are known to occur within the project area. A research project located inside the project area collected vegetation data on several transects during 2003, 2004, and 2005. No Forest Service Sensitive species were found on any transects. Survival rankings from NatureServe are shown in Table 7 for the two plant species that will be addressed in the effects analysis.

Table 7. NatureServe Explorer Species Survival Ranking, January 15, 2009

Species	Global Ranking	National Ranking	State Ranking
Mt. Dellenbaugh sandwort (<i>Arenaria aberrans</i>)	G2 - Imperiled	N2	S2
Rusby milkvetch (<i>Astragalus rusbyi</i>)	G3 - Vulnerable	N3	S3

Direct and Indirect Effects on Sensitive Plant Species

There is no suitable habitat for any Threatened, Endangered, Candidate, or Conservation Agreement plant species within the Community Tank Project Area. No listed species are known to occur there. There will be no effects to any listed species.

There is no suitable habitat in the project area for most Forest Service Sensitive plant species. These species will not be discussed here because there will be no effects.

The discussion below focuses on the two Forest Service Sensitive plant species for which there appears to be potential suitable habitat in the Community Tank Project Area. At this time, no sensitive plant populations are known to exist within the project area.

Mt. Dellenbaugh sandwort (*Arenaria aberrans*) is a small perennial plant that occurs in meadows or near meadow edges within oak and pine forests at elevations between 5500 – 9000 feet. This species is known only from northern and north-central Arizona (McDougall 1973). Little is known about the current distribution of this plant. It has reportedly been collected from the Williams area, DeMotte Park on the North Kaibab Ranger District, the South Rim of Grand Canyon National Park, and Mingus Mountain on the Prescott NF. There may be marginally suitable habitat within the Community Tank project area, but it has not been observed there.

Alternative 1: No Action – *Arenaria aberrans*

There would be no direct mortality from project-related mechanical soil disturbance or prescribed fire. Continuing tree encroachment would degrade suitable habitat by reducing the availability of sunlight and nutrients. The habitat and populations would be at high risk of destruction by catastrophic fire.

Alternative 2: Proposed Action - *Arenaria aberrans*

Understory burning may benefit Mt. Dellenbaugh sandwort habitat by decreasing the density of trees. There could be an increase in nutrient availability. If any plants were present, some could be killed or damaged by mechanical soil disturbance or prescribed fire. If any plants are found before or during project implementation, best management practices will be put into place to protect the plants from long-term adverse effects. These practices would include avoidance of mechanical disturbance and pile burning. After the project is completed, habitat and populations would be less vulnerable to effects of catastrophic fire.

Rusby milkvetch (*Astragalus rusbyi*) is a perennial herb occurring on dry or temporarily moist basaltic soils in aspen groves, mixed conifer, ponderosa pine/ Arizona fescue, and ponderosa pine/ Gambel oak. Known locations of this plant include Kendrick Mountain, Fort Valley, Camp Navajo, near Garland Prairie, near Volunteer Canyon, Viet Springs, and the Wild Bill Study Plots. It is also reported from Mt. Trumbull, north of the Grand Canyon (Springer 1999). It is known to occur within Terrestrial Ecosystem Unit 401, approximate 10 acres of which does occur on the eastern side of the Community Tank project area, but it has not been found there.

Bull thistle and Dalmatian toadflax grow in Rusby milkvetch habitat and are a concern where prescribed fire is planned or soil disturbance is likely. Both of these noxious and invasive exotic weeds benefit from

fire, increasing in both density and distribution. They have the potential to dominate the understory vegetation, out-competing Rusby milkvetch and its associated native plant species (Noxious Weed EIS 2005).

Alternative 1: No Action - *Astragalus rusbyi*

There would be no direct mortality or injury from project-related mechanical soil disturbance or prescribed fire. Increasing tree density would degrade suitable habitat by decreasing availability of light and nutrients. The habitat and populations would be at high risk of destruction by catastrophic fire.

Alternative 2: Proposed Action - *Astragalus rusbyi*

Tree removal in the ponderosa and mixed conifer would benefit Rusby milkvetch habitat by opening up the canopy. However, habitat value may be decreased if the canopy is completely removed. If any plants are present, they could be killed or injured by mechanical soil disturbance or prescribed fire. If any plants are found before or during project implementation, best management practices will be put into place to protect the plants from long-term adverse effects. These practices would include avoidance of mechanical disturbance and pile burning. After the project is completed, the species and the habitat would be at lower risk of destruction from catastrophic fire. The threat of introduction of bull thistle and Dalmatian toadflax will be mitigated by cleaning all equipment prior to staging it in the project area and by surveying the project area periodically post-implementation and eradicating any weeds.

Cumulative Effects on Sensitive Plant Species

There are no cumulative effects on Threatened, Endangered, Candidate, or Conservation Agreement plant species. There are no cumulative effects on most Forest Service Sensitive plant species. Only Mt. Dellenbaugh sandwort and Rusby milkvetch will be addressed here.

The analysis area for cumulative effects on sensitive plant species is all of the ponderosa pine, pine – oak, and pine – pinyon plant communities on volcanic soils mapped on the Williams Ranger District in the Terrestrial Ecosystem Survey (1991). The cumulative effects time period spans 25 years, from 1990 through 2015. Specific past and present timber sales, forest health projects, and fuels treatments that may have impacted sensitive species are Beacon, Round-Oak-Tule, Reneke, Elk Lee, Dogtown, Frenchy, Clover High, Marteen, Williams High Risk, Brannigan, Spring Valley, Pineaire, Barrier, and Kendrick-Newman. A grassland maintenance project, Signal Hill, was also implemented during this time period. Any of these activities have the potential to degrade habitat or directly damage or kill any existing plants, but all have long-term beneficial effects on sensitive plant habitats. Livestock grazing has occurred and is expected to continue to occur throughout most of the analysis area for the entirety of the analysis period.

There is potential habitat for the Mt. Dellenbaugh sandwort and Rusby milkvetch in portions of the analysis area. Rusby milkvetch does occur on Kendrick Mountain and East Newman Hill, approximately four miles east of the proposed project area.

Any vegetative treatments (timber sales and thinning) or burning treatments decrease tree density and open the overstory canopy to some degree. Complete removal of the canopy over large areas for long periods of time could be detrimental to any of the sensitive plant species potentially affected by the Community Tank project. All of these types of the projects listed above have thinned the woody vegetation, none were clear cuts. Most of the projects were staged over several years, so large contiguous patches of sensitive plant habitat were not opened up at one time. Habitat, and possible plant populations, were able to recover from the short term disturbances, and would be benefited in the long term. Where project areas overlapped, treating the same area more than once, the time lag between treatments was sufficient to allow recovery. The Community Tank project continues this strategy. There should be no

cumulative negative effects on sensitive plant species from treatment of woody vegetation or fuels treatments

The full impact of livestock grazing on the Williams Ranger District on Mt. Dellenbaugh sandwort and Rusby milkvetch is unknown. Grazing in known populations of Rusby milkvetch does occur. Plants there are vigorous and populations are dispersed throughout the available habitat. Juvenile plants are intermingled with adults. Past grazing intensities, which were much higher than the current level, may have depressed populations. Whether the populations have rebounded with decreased grazing or they are simply not significantly impacted by grazing is unknown. Grazing within burn units on the Community Tank project will be avoided for at least one season after burning, in order to minimize the impact of simultaneous activities.

Mitigation measures in the proposed action provide for avoidance of mechanical disturbance and pile burning around sensitive plant populations (should any be discovered). This, and the likely improvement of habitat as a result of the project, assures that the project will not add significantly to past, ongoing, or future impacts. The project may cause short-term impacts to habitat or populations, but is not likely to result in long-term loss of population viability or to cause a trend precipitating the need for federal listing as Threatened or Endangered.

NOXIOUS AND INVASIVE WEEDS

Affected Environment

Noxious or invasive exotic weed species that are known to occur on the Williams Ranger District are cheatgrass (*Bromus tectorum*), Dalmatian toadflax (*Linaria dalmatica*), diffuse knapweed (*Centaurea diffusa*), Russian knapweed (*Acroptilon repens*), spotted knapweed (*Centaurea stoebe* ssp. *micranthos*), Scotch thistle (*Onopordum acanthium*), bull thistle (*Cirsium vulgare*), jointed goatgrass (*Aegilops cylindrica*), Russian olive (*Elaeagnus angustifolia*), saltcedar tamarisk (*Tamarix ramosissima*), and Siberian elm (*Ulmus pumila*). Some of these populations have been treated using manual, chemical, or biological control methods. Weed monitoring, new treatments and re-treatments occur annually on the District.

Cheatgrass is the only one of these species that was found within the Community Tank Project Area during surveys in August 2002 and February 2006. A research project located inside the project area collected vegetation data on several transects during 2003, 2004, and 2005. Cheatgrass was the only invasive exotic weed recorded on the transects. Bull thistle has been found close to the project area, along Forest Roads 171, 194, and 705, near BR Tank, and on Moritz Ridge.

High-intensity wildfire is a concern for exotic weed management because it favors the expansion of existing weed populations into new areas by exposing bare soil and removing the live canopy over large areas. Areas on the Pumpkin (2000) and Trick (2002) Fires that burned at high intensity have since been invaded by bull thistle and Dalmatian toadflax (personal observations, Johnson, 2001-2006).

Direct and Indirect Effects on Noxious Weeds

Alternative 1: No Action

No new habitat for noxious and invasive exotic weeds would be created due to soil disturbance from tree felling or burning. There would be no increase in likelihood of introducing noxious and invasive exotic weeds due to importation of propagules on equipment used for thinning or burning. There would be no post-project monitoring to detect if weeds invade from nearby populations, so there is some risk of new populations establishing and spreading undetected. The area would become increasingly vulnerable to

high intensity wildfire and its attendant risk of creation of large areas vulnerable to noxious weed invasion.

Alternative 2: Proposed Action

Thinning and burning would create large areas of increased sunlight and some small, temporary patches of bare soil. This would cause a temporary increase in habitat for noxious and invasive exotic weeds. Noxious and invasive exotic weeds could be introduced via propagules on trucks and other equipment that are brought into the project area. However, best management practices will be in place in order to help control the spread of noxious and invasive exotic weeds, such as cheatgrass which is known in the area (see Appendix A). The area would be monitored for at least three years after implementation, in order to detect and control any new weed populations. The proposed action would reduce the risk of future high intensity wildfire, thus reducing the potential for widespread creation of weed habitat

Cumulative Effects on Noxious Weeds

Weed seeds are readily transported by wind, water, vehicles, wildlife, livestock, and humans. Because of this, weeds on any part of the Ranger District could be spread to any other part of the district. Therefore, the cumulative effects analysis area for noxious and invasive exotic weeds is the entire Williams Ranger District. The first documented introduction of noxious and invasive exotic weeds onto the district due to a land management project was in 1988, when bull thistle came in as part of a seed mix (D. Brewer, pers. comm., 2005). The first documented weed survey was in 1997 (Lutz and Crisp, 1997). A number of noxious species, including bull thistle, Scotch thistle, Dalmatian toadflax, and jointed goatgrass, were located along roadsides, near trailheads, and on stock tanks throughout the Ranger District. Due to lack of information about how and when weeds were introduced and their rate and direction of spread, the analysis period begins in 1996, a year prior to the 1997 survey.

Past (implemented since 1996) and present project areas that are known to harbor noxious and invasive exotic weeds are: Twin, City, Dogtown, Beacon, Marteen, Spring Valley, Government Prairie, Barrier, Pineaire, Brannigan, and Kendrick-Newman. Aside from Brannigan (whose pre-project status is unknown), the weeds are known to have been present prior to the project being implemented. None of the projects appear to have been the source of noxious and invasive exotic weeds that occur outside the project area. All projects planned since 2001 have included mitigation measures to decrease the risk of noxious weed introduction or spread. Ongoing road maintenance activities are expanding existing noxious species populations as well as spreading weeds to new uninfested roadside locations. Noxious and invasive exotic weeds occur on several grazing allotments. Their presence appears to be due largely to past (pre-analysis period) logging and thinning activities and to roadside disturbances, rather than to soil disturbance or seed dispersal by cattle.

Future projects on the Williams District that may increase weed habitat or populations include the Transwestern gas pipeline, Williams target range, road maintenance and closures, aspen restoration, grazing, dispersed and developed recreation, McCracken vegetation treatment, Saginaw-Kennedy vegetation treatment, and fuels treatments on Bill Williams Mountain. All of these activities except dispersed recreation will include weed prevention, monitoring, and control measures. To date, there are no known weed infestations (other than cheatgrass) in the most heavily used dispersed-use sites.

There are noxious and invasive weed populations on the Williams District as a result of past projects. Every project introduces some risk of introducing or expanding weed presence and impacts on the District. Mitigation measures decrease the magnitude of the risk, both spatially and temporally, but cannot eliminate them. The Community Tank project will cause a small, short-term increase in the cumulative risk of impacts from noxious and exotic invasive weeds.

RANGELAND VEGETATION AND RANGE MANAGEMENT

Affected Environment

The majority of the project area is within the Government Mountain Allotment; a very small portion is within the Moritz Lake Allotment. The proposed project is almost entirely within the Spring Valley Pasture, which is generally grazed 16 to 17 days each year, eight out of every nine years. The grazing period occurs sometime between May 15 and September 30. A small area on the east side of the project juts into the Newman North Pasture. Another small area on the north side juts into the Moritz Pasture of the Moritz Lake Allotment. The Government Mountain Allotment has nine pastures, managed in a rest rotation system. The number of cattle allowed to graze is adjusted each year according to the amount of forage present. The maximum number of adult cattle permitted to graze on the Government Mountain Allotment is 420.

Several fences are found within the project area. There are allotment pasture fences, waterlot fences around Community Tank and Section 10 Tank, and private land boundary fences.

Three permanent long term range vegetation monitoring transects are located within the project area. Cluster 2 is located north of FR 715 near FR 194. Cluster 8 is located southwest of FR 715 in the SW corner of Section 1. Cluster 9 is located at the south end of the project area on the west boundary of private land in the SE corner of Section 10. It is important to protect the soil and vegetation in these areas from mechanical ground disturbance and high intensity fire. Angle iron fence posts and witness trees mark the transect locations. The witness trees must be preserved. Otherwise, the vegetation should be treated in the same manner as that in the rest of the project area.

Range analysis maps from 1912 show most of the project area as open grassland, dominated by blue grama, pingue, snakeweed, and rabbitbrush. Inside the project area, only the southern edge of Moritz Ridge and an area south of Raymond Lake are shown as forest or woodland, with pines and bunchgrasses. Currently, the only open grassland is in the northeast part of the project, including and extending south from Community Tank. Elsewhere, the project area has been invaded by pines and junipers.

According to the Terrestrial Ecosystem Survey (1991), savanna vegetation may have occupied the eastern, southern, and northwestern fringes of the project area. Approximately two-thirds of the interior soils are intermingled grassland and woodland soils, indicating that patches of savanna may have been interspersed with the grassland. The remaining third, all grassland soils, extends south and east of the current grassland around Community Tank.

Direct and Indirect Effects on Rangeland Resources

Alternative 1: No Action

Forage species will continue to decline as tree cover becomes denser. High intensity wildfire could kill most native grasses and allow the widespread establishment of cheatgrass.

Alternative 2: Proposed Action

Removing most of the woody overstory would have very beneficial effects on forage species habitat, due to the increased availability of light, water, nutrients, and space. If the existing seed bank is adequate, grasses and forbs could establish quickly. If weather is favorable, native herbaceous species could expand their cover. However, if the seed bank is inadequate and/or the weather is unsuitable, there may be very little herbaceous establishment for several years. Mitigation measures in the proposed action allow for possible seeding and/or restriction of livestock grazing if needed to encourage establishment.

Best management practices will protect the range monitoring transects and the fences from damage by project activities.

Cumulative Effects on Rangeland Resources

The cumulative effects analysis area is the entire Williams Ranger District. The analysis period is 1997 through 2017, roughly ten years before and after project implementation. Due to the erratic nature of Arizona's weather, impacts of projects on forage resources are highly variable in how long it takes for them to become apparent; ten years is an estimate.

Projects to consider are the same as those considered for sensitive species and noxious and invasive exotic weeds, plus several grassland maintenance projects carried out in juniper woodland. Vegetative treatments (timber sales and thinning) and burning treatments decrease tree density and open the overstory canopy to varying degrees. Complete removal of the ponderosa pine canopy over large areas is, to date, fairly unique to the Community Tank project. All the projects considered likely cause some limited forage plant mortality or injury. None of the timber projects have resulted in any widespread or prolonged loss of herbaceous vegetation. The majority of these projects are beneficial to forage species because they reduce competition from trees. Low- to moderate-intensity prescribed burns are also primarily beneficial. However, prescribed fire sometimes burns hotter than predicted and does cause noticeable decreases in herbaceous production. Examples of this can be seen on portions of the Marteen Burn.

Because the majority of impacts from vegetation management and prescribed burning are beneficial, and because the impacts of the Community Tank project are also beneficial to herbaceous vegetation, there will be no cumulative negative impacts to forage resources due to implementation of the project.

FIRE AND FUELS

Affected Environment

Fuel loadings in the analysis area currently range from 2 to 30 tons/acre. The lower fuel loadings are in open areas and where ponderosa is encroaching into meadows. The following represents the current composition of fuels in the area: 1 to 2 tons/acre of 0-.25 inch material; .5 to 1 tons/acre of .25-1.0 inch material; 2 to 4 tons/acre of 1 to 3 inch diameter material; and occasional loading of 15 to 30 tons/acre above 3 inches. Thickets of small diameter trees increase the potential for high intensity, stand replacing fires. The vertical continuity of the stands allows fire to move from surface fuels through smaller understory trees, and into the crowns of larger trees. The Community Tank Vegetation project area, popular for dispersed recreation activities, is at a high risk for a major wildfire.

The project area contains lands that meet the definition of wildland urban interface (WUI). There are 225 acres of "intensive zone" WUI which is the area within 1/8 mile (660 feet) of private property and residences. This zone is considered the last line of defense against an advancing fire threatening private property, and the first line of defense in stopping a fire that is spreading from private property onto national forest lands. Fuels reduction treatments within the intensive zone are generally higher priority than those in the extensive zone.

In the project area, prevailing winds are out of the southwest with fires typically spread more rapidly and have longer spotting distances toward the north and northeast. Because of this, the "extensive zone" zone is defined as the area between 1/8 mile and one mile on the south and west, and 1/8 and 1/2 mile to the north and east of private property. There are 935 acres in the extensive zone. Approximately 465 acres in

the community Tank lie outside the extensive zone. Currently, fire risk ratings range from low to medium (or moderate) in all three areas.

Direct and Indirect Effects on Fire Hazard and Risk

Alternative 1– No Action

With no proposed management activities occurring, forest density will continue to increase, fuel loading would be higher, and tree crowns would continue to grow and interlock. Higher forest density will result in extreme fire behavior due to ladders fuels and heavy fuel loading causing the fire to climb up to the canopy and interlocking canopy will sustain the fire as a running crown fire. The safety of the public and firefighter would decrease as the fuel loading increase in the event of a high intensity wildland fire.

Alternative 2 – Proposed Action

As a result of management activities, there would be a short-term increase in activity-generated fuels and fuel loadings. Following pre-treatment of fuels, the prescribed slash disposal technique for the analysis area is 100% prescribed fire. Therefore, existing and activity-generated fuels would be reduced through the lopping of slash, rough piling, machine piling, and/or prescribed burn.

The alternative would reduce the fire hazard by reducing the understory fuel ladder. By thinning and lopping, this would remove smaller fuel which will carry fire into the canopy; it will also reduce the fire behavior activity and easier to control during prescribed fire treatment. Prescribed Fire would aide in restoring grass/forb nutrient recycling processes and reduce future encroachment of trees in the open grassland be killing new tree seedlings. Fire risk would also be abated through thinning by creating openings in the canopy, reducing the potential for crown fires and least intense fire behavior. Alternative 2 has been identified as wildland-urban interface, the areas consist of homes and other structures. However, the risk of catastrophic wildfire in this area is relatively low at present due to fairly low understory fuel loadings and openings in the forest canopy. Weather condition, wind pattern and staffing level will be closely monitored while burning around wildland-urban interface. District Fire Information Officer, will make contacts with local residents and/or media prior to any prescribed burning.

The analyses area has a fuel loading of 4 to 8 tons/acres (refer to Photo Series for Quantifying Forest Residues in the Southwester Region, pg 73 of data sheet 2-PP-2) of material 3 inches in diameter or greater is the acceptable level of fuel loading. During implementation, dead and down material, 12 inches in diameter and 8 feet long in length will be protected by different style of ignition pattern and/or avoiding of direct ignition. However, some of these fuels may be consumed by the prescribed burn. Snags that are 18 inches in diameter or greater and 30 feet in height or taller will be protected by avoiding direct ignition, burning under cooler condition and or scraping the base of snag down to mineral soil. All yellow pine, juniper or pinyon pine $\geq 18''$ in diameter will be protected from prescribed burning by removing heavy fuels form the base of these trees. Fire risk is higher in the area of the northern portion of the project area directly below Moritz Ridge where tree density and fuel loadings are higher. Dozer lines and/or hand lines would be constructed where road or other suitable fuel breaks do not exist in order to contain the prescribed burn. District Fuels Management Officer or the Burn Boss will make sure that all dozer lines will be rehab by ripping and/or seeding.

Within the intensive zone there would be an absence of dead, down woody material, and individual trees would be widely spaced so crowns are separated. Activity slash from the felling of trees within 300 feet from the private land will be mechanically crushed and/or lopped to less than 3 feet in height to better control prescribed burn.

Within the extensive zone trees would vary in age and density, and occur as a vegetative mosaic interspersed with openings. The area would remove more trees than in the intensive zone; any slash will

be lopped to 2 feet and/or pile by mechanical to reduce fire behavior. Extensive zone will be treated prior to intensive zone, this will reduce safety concerns to the public and fire fighters and to establish a good control black line as we proceed south toward intensive zone. The goal would be an overall fire risk rating no greater than moderate. Any non vegetation treatment or areas where only prescribed burn treatment is done (northern part of the project), these areas will consist of pre burn treatment such as reducing ladder fuels, and reducing any fuels that will create hazard or controlling the fire.

Cumulative Effects on Fire Hazard and Risk

Because hazardous fuel conditions have the potential to pose a threat to private property and forest resources when they are several miles away, the area analyzed for the cumulative effects analysis for fuels extends 3 miles outside the project boundary. Fuel loadings in ponderosa pine following a burn return to pre-burn fuel loadings in approximately 10 years. Cumulative fuels effects are also examined from 10 years past to 10 years into the future.

Treatments in the Analysis Area in the last 10 years:

About 8,900 acres was prescribed burned in recent years north and east of the project area during the Kendrick project.

Outside of the area discussed above, the remainder of the cumulative effect analysis area shows that Dead Woody Debris (DWD) is increasing in these stands; Crown Base Heights (CBH) are remaining constant and stand density is increasing; therefore, potential for severe fire behavior is increasing with the potential for passive crown fires during fire season, or possibly active crown fires, as a result of current drought and fuels conditions.

Ongoing and Planned Actions In and Around to the Community Tank Project Area:

The Kendrick Project has been implemented and covers 8,900 acres north and east of the Community Tank project. Treatments have included prescribed burning and thinning. The 9000 acre Government Project lies southeast of the Community Tank project and has been implemented as well.

The net effect of the proposed action would be a decrease in Dead Woody Debris (DWD) and stand density and an increase in crown base height. As a result, potential fire behavior would be decreased over time within the cumulative effects analysis area. The Community Tank project would contribute to the ongoing "landscape-level" treatments that are moving the urban interface in the Williams District toward more desired defensible conditions.

AIR QUALITY

Affected Environment

Historically, air quality and visibility on the Williams Ranger District have been good. The Community Tank analysis area is located in the northeast portion of the district in Air shed Unit 5.

The following communities and areas may be affected by management activities that create smoke and dust:

Local Residents	Private Landowners/Residents within the Project Area (PA)
Parks	9 miles south of the PA
Bellemont	10 miles southeast of the PA
Flagstaff	19 miles east of the PA

State Highway 64	12 miles west of the PA
State Highway 180	7 miles northeast of the PA
Pumpkin Center	1 mile northeast of the PA
Williams	14 miles southwest of the PA

Direct and Indirect Effects on Air Quality

Alternative 1– No Action

Since no proposed management activities would occur under this alternative, smoke would not be created from piled or broadcast burning and dust would not be created from commercial timber harvest operations. But without proposed fuels reduction treatments, the potential risk for a high intensity stand-replacement fire is increased to moderate and will go to high in the near future. In a wildfire situation, smoke particulates and dust would not be controllable; therefore it will result in high amount smoke impacted into the affected areas for a period of 10 or more days. The suppression tactical equipment (fire engines, dozers w/ lowboys, etc) would put up high volume of dust alone Forest Road 141 and 144. Further, hazardous materials (houses, vehicles, chemicals, etc.) could burn. Smoke particulates could increase dramatically due to large areas burning and entire tree stands consumed.

Alternative 2 – Proposed Action

Under the alternative action, heavy equipment (trucks, dozer, forwarders) used in tree harvesting operations would create dust. On-site equipment, such as dozers and forwarders, would create small amounts of dust in a much localized area with short-term impacts. This dust would be relatively unnoticeable to private land area and forest visitor. Dust from logging trucks would result in a short-term decrease in air quality within 330 feet of dirt or gravel surfaces haul roads. A provision will be added to any timber sale contract that will restrict log truck traffic to 15 mph for a one-mile stretch alone Forest Road 141 and 144 in area near homes.

The use of fire as a management tool, and restoring fire to its natural role in the ecosystem, carries with it the possibility of occasional impacts from smoke to the surrounding areas (see the sensitive areas above). Low to Moderate smoke concentration will be present in the immediate area during the initial burn period but will decrease over a period of two to three days. Generally, ignition will cease at mid-afternoon to mitigate the down drainage smoke concentration during implementation of the project. Prescribed Burning will take place when weather conditions are favorable for good dispersion and ventilation of smoke. Burning will be conducted under the authorization of the Arizona Department of Environmental Quality (ADEQ) and in compliance with the project burning and monitoring plan.

Cumulative Effects on Air Quality

Raw material amounts (due to emissions), ventilation, unit size, wind speed and direction, and proximity all affect smoke impacts. Ventilation is the degree to which smoke disperses into the atmosphere. Proximity is the distance from the source of smoke to the impacted area (generally residences). Ventilation is usually best during the summer wildfire season; however, this gain is usually lost due to the much greater volume of smoke that is created at this time. Ventilation can also be improved during prescribed fire operations due to controlled ignition during the best ventilation hours of the day. Conversely, wildfires burn during all hours of the day (including evenings and mornings that compound smoke impacts). In addition, a day can be selected to burn based on wind speed and direction in order to minimize smoke impacts. Smoke impacts to local residents will further be reduced by mechanically pulling and piling slash up to 300' away from private residences in the western of project area. In a wildfire condition, this material would burn and smolder along the private property boundaries. Finally, smoke impacts will be reduced during prescribed burns by burning on days with acceptable ventilation, with safe and appropriate winds.

Since the burning windows have been expanded for management prescribed fires, it is likely that simultaneous burning would occur in other areas on the Kaibab National Forest, city, state, and private lands during the life of this project. Therefore, it is expected that smoke created from burning on this project would cumulatively add to the general short-term decrease in air quality during burn periods for both Forests. Arizona Department of Environmental Quality (ADEQ) has identified 11 geographic areas called “Air shed”, also known as Smoke Management Unit. These areas are defined by ADEQ whose area is based on primary watershed boundaries and whose outlines are determined by diurnal wind flow patterns that allow smoke to follow predictable drainage patterns. As mention in Affected Environment; Community Tank project is in Air shed 5 (Verde River Air shed).

HERITAGE RESOURCES

Affected Environment

Archeologists intensively surveyed 1284 acres for this project (Sorrell 2002). The survey covered all areas where project managers propose using heavy equipment that could disturb heritage resources. Archaeologists discovered 26 heritage sites, all but two of which are obsidian scatters. The two historic sites are related to Basque sheep herding encampments. None of these sites have been evaluated in sufficient detail to determine their eligibility to the National Register, but all will be treated as eligible for the purposes of this consultation. Sites 03070200810, -811, -1370, -1371, -1372, -1374, and -1859 through -1878 are within the area of proposed activities, or are sufficiently close to warrant protective measures.

The Community Tank landscape is characterized primarily by plains and small valleys that have developed around eroding Tertiary basalt flows. Soils in the area are predominantly alluvial and residual basaltic silty sands with generally abundant gravel. Elevation ranges from 7100 to 7360 feet. The vegetation of the project area is dominated by grasses, broom snakeweed, and invasive Ponderosa pines, but also includes occasional alligator juniper, gooseberry (possibly wax currant), and prickly pear and hedgehog cacti. There is no permanent source of water within the project area, but seasonal lakes are located nearby, and water can be found seasonally flowing through drainages within and around the project area, especially during the spring melt.

Basque use of the project area occurred during historic and modern times. The Basque sites in the project area differ in no substantial way to other Basque sheep-herding camps recorded on the Kaibab Forest. Most Basque camps are ephemeral, usually located near a water source. (Sorrell 2002)

Direct and Indirect Effects on Heritage Resources

Alternative 1 - No Action

Under the no action alternative, the direct effect would be that fuels may continue to accumulate on heritage resource sites increasing the risks posed to sites from naturally-ignited wildfires. Sites exhibiting wooden components (fire-sensitive sites) will remain at the greatest risk.

The indirect effects would be to fire-sensitive sites outside of the proposed treatment area that could be affected if a wild fire spread outside of the project area.

Alternative 2 - Proposed Action

Archeologists intensively surveyed 1284 acres for this project. The survey covered all areas where project activities employing mechanized equipment could directly affect heritage resources. As all eligible or potentially eligible heritage resource sites will be marked for protection from ground

disturbing project activities, there should be no direct or indirect effects to heritage resources. Because timber specialists will design personal use fuelwood areas to exclude heritage sites, there will be no direct or indirect effects on any of the sites. Proposed low intensity grassland prescribed burns will have no adverse effects on any of the obsidian sites (Sorrell 2002). In fact, the thinning and burning treatments are intended to regenerate depleted grasslands that will stabilize soils and thus stabilize the condition of all archaeological sites. Preservation of heritage resource sites may result in a light reduction of timber volume and silvicultural treatment. If mitigation measures are followed, there will be no adverse effects to any heritage resource sites

Cumulative Effects on Heritage Resources

Because potential effects to heritage resources will be avoided in Action 2, there will be no cumulative effects.

SCENIC RESOURCES

Affected Environment

The Community Tank area includes several stands of meadows and savannas that have been invaded by ponderosa pine over the last 130 years, as well as some forested rocky outcrops. The area runs to the east of Conner's Hump, to the south of Moritz Ridge and north of FR 194. The forested and encroached areas have trees that are mostly 60 to 80 years in age. Yellow pine trees (Ponderosa pine greater than 140 yrs. old) are almost nonexistent within the area.

The Forest Plan Scenery Integrity Objective (SIO) for the proposed treatment areas is SIO 2 (High), as they are located adjacent to and within the foreground viewing distances of sensitive travel corridors (FSRs 141 and 144). The Recreation Opportunity Spectrum for the project area falls within "Rural" and "Roaded Natural" meaning that the "changes to the natural vegetation patterns may be evident but are in harmony with the natural setting."

Following is a description of SIO 2 objectives and goals excerpted from the Kaibab NF ROS/SMS Guidebook. The general setting description for SIO 2 (High) is the valued landscape character "appears" intact. "Deviations (from the landscape character) blend so well that the change is not evident to the casual observer by the end of the project activity."

Direct and Indirect Effects on Recreation Opportunity

Alternative 1 – No Action

This alternative includes no new proposed management activities to restore grasslands and open pine savanna ecosystems, where they once existed in the project area. The process of forest succession would continue, and changes to the scenery would result from natural disturbances, without planned human intervention. Tree encroachment into the project area's natural meadowlands would also continue, gradually replacing natural grassland meadow species. Tree mortality from insects and disease may become more evident in the area as stressed trees continue competing for limited resources. The wildland-urban interface zone is currently defined as any area being next to, or near, private property. The western and southern boundaries of the proposed project area border private property. There are homes and other structures found on these properties. Risk of catastrophic wildfire in this area is relatively low at present due to fairly low understory fuel loadings and openings in the forest canopy. This risk will continue to increase over time as the forest becomes denser and forest canopies close. Although natural processes such as wildfire and insect activity are viewed by the Scenery Management System as integral processes affecting landscapes, it is also generally accepted that large-scale stand-replacing fires or insect outbreaks may be visually unappealing to some forest visitors, and may not be considered socially acceptable, especially in urban and rural interface areas. Eventually, given enough recovery time, Forest Plan SIOs and desirable scenic integrity levels could again be achieved decades into the future.

Alternative 2 – Proposed Action

This proposed grassland restoration project would have a short-term negative direct effect to the existing scenic integrity during project implementation, but is expected to largely recover in 1-2 years. Changes to the landscape character would be evident but would be within historic ranges and would enhance the ability to achieve desired and sustainable landscape character by reducing the potential for uncontrolled wildfires and insect outbreaks and their long-term negative effects. The visible effects of the project would not meet the Forest Plan SIOs until slash is treated; however, mitigation measures to minimize the negative impacts are in place. This alternative would achieve the Forest Plan SIOs shortly after implementation activities with the mitigations are completed. This project is expected to be consistent with the Forest Plan SIOs.

Cumulative Effects on Scenic Resources

The time period for the cumulative effects analysis extends 15-20 years from the first phases of implementation of the Community Tank Project. Twenty years was chosen because large complex projects can take 10 or more years to complete treatments. Once activities are completed in a treatment unit, it takes approximately one to three years for treated areas to recover until they are generally unnoticeable to the average forest visitor (one to two years of drying to dispose (burn) of slash after thinning projects, plus up to one more year for the visual effects of mechanical fire line preparation and prescribed burning). Fuels reduction and stand improvement treatments including thinning, non-commercial and commercial tree harvesting, fuelwood sales, and prescribed burning will occur over time and in phases within the project areas; thus different projects will be in varying stages of treatment or recovery over the 15-20 year period across the cumulative effects analysis area. The effects of mechanical treatments are addressed in this analysis; recurring maintenance burning is typically low intensity and usually recovers within one year of implementation and is considered to have minimal effects on scenic and recreational resources.

RECREATION OPPORTUNITY

Affected Environment

The Community Tank area is comprised of several parcels adjacent to private lands in the Conner's hump area, near the junction of FR 141 and FR 144. These areas do not contain developed recreation site

opportunities to national forest visitors. The primary recreation value to the areas included in this project area are related to the scenic viewing opportunities for forest visitors from FR 141 in the Parks area, and dispersed activities from local residents. Other than visitors enjoying scenic drives, the majority of recreationists are most likely local residents engaging in cross-country travel by foot and horseback, off-road vehicle or mountain bike, viewing scenery, or viewing wildlife. It is estimated that this area receives a less-than-average visitation as compared with other areas on the Williams Ranger District.

As mentioned above, the proposed project treatment areas are located adjacent to popular travel routes. The Forest Plan Recreation Opportunity Spectrum (ROS) class for the project areas is Roaded Natural (RN) and Rural (R). Generally speaking, the setting goals for both these ROS classes are to manage landscapes in ways that maintain or enhance recreation and scenic values, sites and features.

Direct and Indirect Effects on Recreation Opportunity

Alternative 1 - No Action

This alternative provides no new management activities within the project area. Therefore, current recreation opportunities and the quality of the experience would remain unchanged relative to these activities. The risk for future stand replacing fires, or continued bark beetle outbreak, is higher than in the action alternative.

Alternative 2 - Proposed Action

This proposed project would have a short-term negative effect on recreation visitors and may occur during project implementation through the voluntary displacement of recreationists during vegetative treatments, prescribed burning and smoky conditions. The ability to protect and maintain quality recreation settings in the long-term would be enhanced under the proposed action by reducing the potential for uncontrolled wildfires or high density insect outbreaks.

There would also be a short-term negative effect on Roaded Natural recreation setting quality during the project implementation; however, the ROS setting quality will be restored once the project is completed and the area is recovered to an “undisturbed appearance.” Since trees will be lopped and scattered or piled and burned, any short-term negative effects from the creation of slash would be very limited and would be expected to recover within the standard scenery management timeframe of one to two years. There will be a long-term protection of the quality of recreation settings due to the lowered risk of uncontrolled wildfires or continued insect outbreaks. Any negative effects caused by the piling and burning would be very limited in scope and would be expected to recover within the standard scenery management timeframe of one to two years. Because of the long-term beneficial effects to related scenic resources, this proposed grassland restoration project would also have a long-term beneficial effect on recreation resources. This project is expected to be consistent with the Forest Plan ROS.

Cumulative Effects on Recreation Opportunity

Current ongoing and recently implemented projects surrounding the Community Tank Project area include Red Rock Grassland Maintenance (GLM), Smoot Lake GLM, South Bull Trap GLM, Antelope GLM, Smoot Moritz GLM, Homestead GLM, Pedigo GLM, Eagle GLM, Potatoe Hill GLM, Hardy GLM, Buggy Wheel GLM, TO GLM, Ivy GLM Spring Valley Beacon, McDermitt, Government, Marteen, Brann, Again, El Paso Roundwood, Parks, West Parks, Ebert Fuelwood, White Hills Fuelwood, Hobbles Fuelwood, Williams Follow-up Mistletoe Treatments, Williams High Risk Pre-commercial Thinning, Government Prairie Prescribed burn, Barrier, Prescribed Burn, and Kendrick Prescribed Burn.

The cumulative effect of the proposed action when combined with past, concurrent and planned actions, would be to potentially increase the total number of acres being treated or recovering from treatment by approximately three percent per year. It is difficult to determine exactly how much of the mechanical

treatments will be accomplished in the cumulative effects analysis area in any given year. Based on recent fuels reduction targets, it is estimated that up to 5,000 acres could be burned each year. Because visible effects of mechanical treatments and final slash treatments can last up to three years, if you assume an annual average of 3,500-5,000 acres then approximately 10,500-15,000 acres, or 11-16% of the cumulative effects analysis area, could be in the physical state of recovering from mechanical treatment and final slash treatments at any one time.

All of the projects within the analysis area include mitigation measures designed to minimize short-term negative effects and speed up recovery near developed recreation facilities and trails; however, outside of those areas the vegetation treatments in progress or recently completed will be evident from one to three years, having a short-term negative effect on recreational settings. These treatment areas will be scattered across the landscape and in varying stages of recovery from year to year. Although there will be some short term negative effects to recreational settings, the long-term effects of reducing fuels and improve stand conditions, are considered to be very beneficial, providing for better long-term protection of healthy forests from potentially large and damaging stand-replacing wildfires. Healthy forests are critical to providing high quality and highly desirable recreational settings and opportunities. The Community Tank Project would improve the cumulative effectiveness and overall ability to protect recreational resources in the long term across the cumulative effects analysis area.

ECONOMICS

Affected Environment

The principal economic activities in this area of Coconino County occur with federal, state, and local governments, retail trade, and the service sector. The trade and service sectors are oriented toward tourism. General government revenue sources include payroll tax, sales tax, corporate income tax, and property tax.

Direct and Indirect Effects on Economics

Alternative 1 – No Action

There would be no economic benefits (i.e., new jobs, income, or tax revenue) associated with the No Action Alternative. With no project activities, potential funds to offset the cost of needed project area improvement activities such as fence maintenance, road obliteration, and fuel reduction activities would not be created. The risk of high-intensity stand-replacing wildfires below Moritz ridge would remain high, as well as the risk of the expensive consequences that go along with such an event. Economic consequences for a stand replacing fire event would cost in suppression activities, post fire rehabilitation, replanting, and further analysis.

Alternative 2 – Proposed Action

The proposed action would potentially generate about 4,900CCF of commercial timber. The value of this timber may either be sold or traded as “goods for services” in a stewardship contract. Receipts from timber sales would help to offset the cost of implementation for non-commercial thinning, fence modifications, road obliteration and prescribed burns. Due to fluctuations in timber prices, it is difficult to project the discrete economic effects of the proposed action. Further, the proximity of the mill locations to the project area makes it problematic to identify the specific locations where economic effects would be felt the strongest. There is one small mill in Ashfork and Williams, Arizona. The Ashfork mill currently has operations suspended. Larger mills are in operation in Phoenix, Arizona and in other areas a similar distance away from the project area. Despite the challenge in identifying the specific quantity and location where economic effects would be felt the strongest, this project would contribute to the direct, indirect, and induced economic effect.

Direct effects are the responses of an industry to demand for goods or services. Indirect effects are produced when a sector must purchase supplies and services from other industries in order to produce output sufficient to meet demand. The employment and labor income generated in other industries as a result are referred to as indirect effects. Induced effects represent the employment and labor income stimulated throughout the local economy as a result of the expenditure of new household income generated by direct and indirect employment. Induced effects often are felt multiple times over as revenues are spent and re-spent in different sectors of the economy.

Non-commercial thinning and prescribed burning have costs associated with implementation, but much of the costs are in the form of wages, which would result in beneficial indirect and induced effects. Indirect and induced economic effects would result from the non-commercial contract activities, sale of merchantable timber and processing of wood products. Wood processed at mill locations could contribute to stimulation of the local economy through purchases such as fuel, food, and supplies.

The following communities could be economically affected by the proposed action

Parks	9 miles south of the PA
Bellemont	10 miles southeast of the PA
Flagstaff	19 miles east of the PA
Williams	14 miles southwest of the PA
Ashfork	34 miles
Phoenix	159 miles

Cumulative Effects on Economics

The immediate analysis area considered for economic effects is for Coconino County, although the effects could reach Yavapai and Mohave Counties in Arizona. Tourism and recreation are the main industries for the immediate analysis area. The timeframe for potential economic benefit to these communities by implementing the proposed action is 10 years. Economic benefits reach beyond the salaries for those working the project, but also provide monetary infusions to the community in the form of rents, supplies (food/fuel) and related services. The Community Tank Restoration Project would provide an economic benefit to the communities; however the effect would likely be small because the total contribution of Kaibab National Forest activities are estimated to be responsible for only about 0.5 percent of the jobs and labor income within the regional economy (KNF 2008).

Environmental Justice

Affected Environment

On February 11, 1994 President Clinton issued Executive Order 12898, *"Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations."* This Executive Order was designed to focus the attention of federal agencies on the human health and environmental conditions in minority and low-income communities. It requires federal agencies to adopt strategies to address environmental justice concerns within the context of existing laws, including NEPA. The goal of an environmental justice analysis is not to shift risks among populations, but to identify potential disproportionately high and adverse effects, and to identify alternatives that may mitigate these impacts. The principle behind environmental justice is simple: people should not suffer disproportionately because of their ethnicity or income level.

There are large Hispanic and American Indian populations in the Southwest. Local Indian tribes were consulted regarding this proposal. Within the project area and the Kaibab, collection of fuelwood is available to all income groups.

Direct and Indirect Effects

Alternative 1 – No Action

The no action alternative does not reduce the risk of high-intensity, stand-replacing wildfire.

Although all communities, wealthy and poor, suffer direct economic consequences when there are large wildfires, normal commercial activity can be disrupted. Many of the low-income jobs in the area are connected to tourism. Even a temporary loss of work can overwhelm low-income individuals and families. Fires can also reduce the availability of native plants and building supplies that sustain many traditional and indigenous communities.

Alternative 2 – Proposed Action

Although there are a high percentage of ethnic minority populations in the Southwest, there is no evidence that the Proposed Action Alternative would disproportionately affect any of these groups. Any adverse effects of the proposed action on these groups are not likely to appreciably exceed those on the general population. There is nothing that indicates the proposed action would have a disparate impact on any low-income populations. The proposed action deals with vegetation and fuels management based upon resource conditions and capabilities, and are applied regardless of a person's ethnicity or income level.

The proposed action alternatives would reduce the risk of high-intensity stand-replacing wildfires, which would better protect the area resources and the communities that they serve.

Climate Change

Currently, Climate change is not addressed in the forest plan but remains a topic in forest plan revision. There are multiple studies regarding climate change but the models used are not yet precise enough to apply to land management at the forest scale. The state of knowledge needed to address climate change at the forest scale is still evolving. This limits forest specific analysis of potential effects from climate change. The summary of overall ecological and socioeconomic conditions based on large scale syntheses and regional studies, written by Richard Periman, April 29, 2008, emphasizes broad changes regarding the southwestern region forest which emphasis the purpose and need of the Community tank restoration project.

- Changes in climate may affect the vitality and productivity of rangeland plants, and in turn affect the overall suitability of both wildlife habitat and range
- Increasing temperatures, water shortages, and changing ecological conditions will likely affect biodiversity, and put pressure on wildlife populations, distribution, viability, and migration patterns.”
- More extreme disturbance events, wildfires, intense rain and wind events
- Long-term shifts in vegetation patterns

These potential effects acknowledged by Richard Periman, 2008 emphasize some climate change issues that might be evident at the Community Tank level. The monitoring of forest specific restored landscapes such as the Community Tank area could help the appropriate adaptive management measures needed at the forest level in regards to climate change.

CHAPTER 4 – CONSULTATION, COORDINATION, APPENDICIES AND LITERATURE REFERENCES

Inter-disciplinary Team Members

Jeff Waters, Wildlife Biologist	Mark Herron, Silviculturist
Mike Uebel, Fire and Fuels Specialist	John Holmes, Timber Specialist
Neil Weintraub, Archeologist	Karlynn Huling, Soils, Watershed and Range Specialist
Martie Schramm, Williams District Ranger	Richard Gonzalez, Forester and ID Team Leader.

Past Inter-disciplinary Team Members

Lauren Johnson, Noxious Weeds Specialist	
Chuck Nelson, Wildlife Specialist	Sam B. Yazzie, Fuels Specialist
Gary Hase, Range Specialist	Tim McGann, GIS Specialist
Stephanie Morgan, NEPA Assistant	Susan Skalski, Williams District Ranger 2002
Ariel Leonard, NEPA Planner	Christine Firzbee, Williams Acting District Ranger 2003
Bob Barsch, AZGFD Representative	Steve Best, Williams District Ranger 2006

Federal, State and Local Agencies Coordination

Arizona Game and Fish Department, Flagstaff, Arizona
Arizona Department of Environmental Quality, Phoenix, Arizona
Arizona Department of Agriculture, Phoenix, Arizona
U.S. Fish and Wildlife Service, Flagstaff, Arizona

Tribal Organizations Consulted

Havasupai Tribe,	Yavapai-Prescott Indian Tribe,
Kaibab Band of Paiute Indians,	Hualapai Tribe,
Navajo Nation,	Pueblo of Zuni
Hopi Tribe,	

Business and Special Interest Groups

Arizona Antelope Foundation, Arizona
Arizona Wildlife Federation, Mesa, Arizona
Center for Biological Diversity, Flagstaff, Arizona
Coconino Sportsmen, Flagstaff, Arizona
Don Glasgow, Ranch Manager, Allotment Permittee, Kirkland, Arizona
Elk Springs Ranch. LLC, Parks, Arizona
Forest Guardians, Sante Fe, New Mexico
Negiller& Sons. Inc, Williams, Arizona
Sierra Club, Flagstaff, Arizona
Spring Valley Holdings. LLC, Parks, Arizona
Rex Maughan, Allotment Permittee, Scottsdale, Arizona
Rocky Mountain Elk Foundation, Flagstaff, Arizona

Appendices

Appendix A: Best Management Practices and Mitigation Measures Specific to the Proposed Action Alternative

Soils and Watershed

1. Equipment and vehicles shall not be operated when soil conditions are such that excessive compaction, rutting or accelerated soil erosion will result. Contract provisions can be used to suspend operations because of wet or saturated soils in order to protect soil and water resources.
2. Vehicles will not be used off road to collect fuelwood when soil conditions are such that excessive compaction, rutting, or accelerated soil erosion will result.
3. Use designated skid trails and landings.
4. Erosion control work shall be kept current immediately preceding expected seasonal periods of precipitation or runoff.
5. Rip compacted soils on skid trails, landings, and fire lines after use.
6. Re-establish natural drainage contours on obliterated roads. Effectively block access. Evaluate the need for seeding to re-establish herbaceous vegetation.
7. Conduct broadcast burns at low intensity in most areas, so that at least 20% cover of vegetation remains to protect the soil. Litter can be substituted for live vegetation in areas that do not currently have much understory plant cover.
8. As directed by soils, watershed, rare plants and range staff, after the slash piles are burned, rip and rake the affected soil. Rake topsoil from a nearby area onto the burn scar in order to spread native mycorrhizae fungi and native seed. These measures help to promote native plant establishment and prevent soil erosion and colonization by noxious weeds such as Dalmatian toadflax. (Reference: "Managing Coarse Woody Debris in Fire-adapted Southwestern Forests", Working Paper 21, Northern Arizona University Ecological Restoration Institute, January 2008)
9. Project activities will adhere to the soil and watershed protection guidelines found in the USDA Forest Service Southwestern Region, Soil and Water Conservation Handbook 2509.22 (1990).

Rare Plants

1. If populations of any rare plant species are found before or during project implementation, the project manager will coordinate with the district rare plant coordinator in order to restrict negative impacts. Examples of best management practices include avoiding mechanical disturbance and pile burning in plant populations.

Noxious and Invasive Weeds

1. Remove mud, dirt, and plant parts from project equipment before moving it into the project area. This practice does not apply to service vehicles traveling frequently in and out of the project area that will remain on a clean roadway.
2. Workers need to inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and equipment after being trained to recognize the priority species in the area. Proper disposal means bagging the seeds and plant parts and incinerating them (or bagging, solarizing the bags, and then taking them to a landfill).

3. If working in an infestation of cheatgrass or other invasive exotic weeds, remove mud, dirt, and plant parts from project equipment before moving it to another area.
4. Minimize soil disturbance to the extent practical.
5. Populations of cheatgrass or other invasive exotic weeds will be controlled as needed before conducting broadcast burns.
6. Design the broadcast burn prescription, so that it will minimize the potential spread of cheatgrass.
7. Treat disturbed soil in a manner that optimizes native plant establishment for that specific site. (See mitigation measures of the proposed action alternative section.)
8. If staff time and budget allow, control weeds on road decommissioning projects before roads are made impassable.
9. If seeding is needed in disturbed areas (for example: landings, skid trails, temporary roads, fire lines, pile burn scars), use only certified weed free seed.
10. Monitor the project area for noxious and invasive exotic weeds for at least 5 years following completion of the project. Control new infestations as staff time and budget allow.

Range Management and Understory Vegetation

1. Protect all fences from damage from tree falling, tree skidding, slash piling, and prescribed burning. Repair all fences, as soon as possible, if any are accidentally damaged by project activities.
2. Protect the permanent vegetation monitoring transects (clusters) and 50 feet on either side. Flag the transects and witness trees before work begins. Do not cut down witness trees or damage transect posts. Do not skid trees across the transects. Do not fell trees in the direction of the transects. Do not crush slash, pile slash, or burn piles along the transects (50 feet on either side). Move slash by hand. Do not create fire lines along transects. Do not create temporary roads across the transects. General tree cutting (other than the witness trees) and broadcast burning is acceptable along the transects, so that the general conditions along the transects remain similar to the conditions in the rest of the pasture.
3. Coordinate with the grazing permittee to regulate livestock grazing during and after the broadcast burning in order to protect livestock and emerging vegetation.

Trees per Acre for the Three Scales of Analysis

Trees Per Acre	Post Treatment Non-PFA Stands Within Project Area	Post Treatment Project Area	Pre Treatment EMA	Post Treatment EMA
VSS 1 (61)	18.57	29.08	71.62	67.76
VSS 2 (41)	10.72	53.37	19.94	22.43
VSS 3 (31)	81.96	108.35	69.21	68.45
VSS 4 (16) (For old growth low site + 5,6)	45.38	35.12	33.54	33.92
VSS 5 (11) (old growth high site)	4.58	6.29	7.06	7.24
VSS 6 (7) (old growth high site)	3.84	4.06	1.71	1.76

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<http://www.fws.gov/southwest/es/arizona/>

Appendix C: Response to Comments

Proposed Log Hauling Routes (720 rd. to 144 rd. through private property):

COMMENT: Dust production is a nuisance to adjacent landowners and poses risk to neighbors with breathing problems. The project activities will add to dust problems already posed by forest users, employees and other landowners. A suggestion was made to include the application of cinders to the road or other road improvement activities to minimize dust impacts.

RESPONSE: To address this issue, project mitigation measures include restricting traffic to (a posted 15 MPH) along a one mile stretch of Forest Roads 141 and 144 in the area near homes in Sections 3 and 10 (see Mitigation # 03) to curtail dust production resulting from project activities. Dust abatement activities (watering of road) are a standard contract provision while these roads are in use by log trucks. These measures will also help address dust from other road users during that time. Also, it is recognized that in the EA sent for public review and comment, the **total** number of truckloads expected to be used (estimated at 625, pg. 8) may have been alarming to adjacent landowners. This number represents the estimated number of truckloads to implement treatments **across the entire project area**. The actual number of trips and timeframe of use on the haul route of concern will be far less.

COMMENT: Log truck traffic along Forest Road 144 present a safety hazard to adjacent landowners with children.

RESPONSE: The posted 15 MPH speed limit (see Mitigation #03) will help to ensure that project activities can be accomplished while not imposing undue safety hazards to adjacent landowners. In addition, the Forest Service will notify adjacent landowners prior to using this stretch of road for hauling of logs (see Mitigation #03).

COMMENT: If enforcement of speed limit and dust abatement requirements is lacking, the dust, health and safety concerns will not be adequately addressed.

RESPONSE: The enforcement of mitigation measures and their associated contract provisions will be the responsibility of Forest Service contract administration staff. Typically, contract administrators are in or near the project area every day during contract operations, ensuring compliance with contract specifications. Internal workforce (burning crews, monitoring crews, etc.) will be made aware of safety and dust concerns and will take actions to minimize these impacts (driving slowly, alternate routes, etc.). Further, adjacent landowners and other concerned public are encouraged to contact the FS administration staff if they feel project mitigation measures are not being followed and/or project activities are not meeting the goals of public health and safety.

COMMENT: Log hauling on roads could degrade the road surface and be a burden to the public in the area.

RESPONSE: Standard contract provisions direct the sale operator (or “purchaser”) to maintain road quality during the implementation of project activities. These provisions include maintaining the road surface (blading) and the maintenance of road drainage features (culverts, ditches, etc.) to prevent damage to roads that are under the jurisdiction of the Forest Service. In addition to these activities during project implementation, the Forest Service collects a deposit (“Road Maintenance Deposit”) from timber sale

purchasers to maintain Forest Service Roads beyond the term of the contract. These deposits help pay for the routine maintenance of Forest Service Roads consistent with maintenance program direction. For roads that may fall under other jurisdiction (City, County, State), road maintenance is accomplished according to their respective programs and paid for through vehicle licensing, registration and other funds. Also, Mitigation # 13 restricts equipment use when soil conditions are such that excessive soil compaction, rutting or erosion would result.

Proposed Buffer of 300 feet around private property:

COMMENT: The proposed buffer distance is not adequate to ensure that visual quality of the area is not adversely impacted by project activities (predominately thinning). A ¼ mile buffer is suggested by adjacent landowners.

RESPONSE: The EA sent out for comment and FINAL EA include a discussion of the visual impacts of the proposed action which included a 300 foot buffer around the private property boundary where vegetative treatments would occur (see Ch. 3 – Scenic Resources). Within the 300 foot buffer, an average of 50 trees per acre will be retained in natural clumpy patterns to provide for visual screening (see Implementation Specifications). It is recognized that a “short-term negative direct effect to the existing scenic integrity” would result from implementing the proposed action. However, “[scenic integrity] is expected to largely recover in 1-2 years. Changes to landscape character would be evident but would be within historic ranges and would enhance the ability to achieve desired and sustainable landscape character by reducing the potential for uncontrolled wildfires and insect outbreaks and their long-term negative effects (EA, pg. 49). Mitigations # 1 and #5 are aimed at reducing the impacts to visual integrity of the project by removing slash from adjacent to private property. Forest Scenic Integrity Objectives (SIOs), as described in the Kaibab Forest Plan, would be achieved shortly after (approx. 1 to 2 year) thinning slash is treated with prescribed burning activities.

The ¼ mile buffer suggestion was considered as an alternative, but was not analyzed in detail (see Chapter 2, Alternatives Considered but Not Analyzed in Detail).

COMMENT: The proposed 300 foot buffer would not be adequate to protect residents from antelope hunters.

RESPONSE: Mitigation #4 will place signs warning hunters of nearby residences and of shooting restrictions within ¼ mile of occupied residences (pursuant to A.R.S.17-309 A 4). These regulations prevent hunters from discharging a firearm within ¼ mile of residences without the owner’s permission.

Analysis should include effects on Bald Eagles and sensitive species identified by AZ Game and Fish and Native American Tribes:

COMMENT: Though the Bald Eagle is “delisted” with the project area, the biological assessment should include an analysis of possible effects on the species (ref. Bald and Golden Eagle Protection Act). Recommend that AZGF and affected tribes be consulted on sensitive species that may not be protected by federal law.

RESPONSE: Effects on Bald Eagles are disclosed in the EA as it is included as a Sensitive Species for the Southwestern Region of the FS (Region 3). It was determined that the proposed action would have little effect on bald eagle habitat and would not adversely affect bald eagles. Comments on the proposed action were provided by AZGF which did not suggest that analysis of additional species was required. Also, tribal consultation is an ongoing process for all KNF activities, and numerous tribes were consulted on the proposed action of this project. No issues or concerns were raised during these consultations.

Project Area Boundary Location:

COMMENT: Arizona Game and Fish officials asked if the southern boundary of the project area could be extended south to the Red Tank Meadow area as antelope have been observed in that area; and if the project area was delineated by historical vegetation maps and/or movement patterns.

RESPONSE: The project area was delineated by historical vegetation maps. Although none are reasonably foreseeable, projects may be pursued at a later date to complement and enhance the pronghorn corridor established by this proposed action.

Effectiveness of Juniper Treatments:

COMMENT: Many young and middle age class juniper trees are currently encroaching on openings within the project area, how will these trees be treated. Alligator juniper trees are notorious for sprouting after being cut, reducing the effectiveness of grassland restoration efforts. Monitoring of project effectiveness and consideration of further treatments (grinding and/or herbicide) is suggested for controlling Juniper regeneration.

RESPONSE: Depending on the location within the project area, the juniper trees will be cut and/or treated with prescribed fire to restore the grassland ecosystem. (See Chapter 2 – Proposed Action, Figure 2). Maintenance burning (every 4 to 12 years) will be used to prevent encroachment of trees. Project success will be monitored during and after implementation to ensure desired conditions are being met. At this time, grinding and/or herbicide use is not being considered under this proposed action, however future project planning could consider these treatments if monitoring suggests maintenance burning is not effective in perpetuating the grassland ecosystem (subject to further NEPA analysis and public involvement).

Snag and dead and downed woody debris retention:

COMMENT: There are currently very few snags and low levels of coarse woody debris within the project area. Existing snags should be retained and the project may want to consider creating snags and coarse woody debris for the benefit of wildlife species (small mammals and birds).

RESPONSE: The Implementation Specifications listed on page 8 of the EA direct the retention of existing snags except when these snags pose a safety hazard (to crews and operators) and/or a fire risk. Additionally, Mitigation #08 directs the retention of some trees that contain lightning strikes and/or dead tops. These trees will add to levels of dead wood available for wildlife. Additionally, it can be expected that some trees may die as a result of prescribed fire activities, further adding to snag numbers. Coarse woody debris retention for wildlife is noted, but must be balanced with visual quality objectives. The Fire and Fuels analysis (Chapter 3 – pp. 43-45) directs the protection of dead and downed material, greater than 12 inches in diameter and 8 feet long from ignition during prescribed burns, helping to retain coarse woody debris (Mitigation #09).

Pile Burning:

COMMENT: Burn pile locations may be susceptible to colonization by invasive/exotic weeds and may reduce biodiversity in the area. A suggestion to seed these locations was made.

RESPONSE: The Best Management Practices outlined in Appendix A of the EA include a measure to promote native plant establishment and prevent soil erosion and colonization by noxious weeds. The measure calls for the ripping and raking of effected soils at the direction of the district Botanist. Raking topsoil from nearby areas onto the burn pile location will promote native mycorrhizae fungi and bring in native seeds. If monitoring shows new weed populations with the project area, these populations will be controlled according to current program direction.

Domestic livestock use within the project area following project implementation:

COMMENT: Given that the goal of the project is to enhance antelope travel corridors, the FS should consider removing the project area from existing grazing allotments to protect native plant and animal species, soil conditions, hydrologic systems and ecosystem processes (e.g. fire). Further, the FS should consider using the project area as a long-term monitoring and educational area to study the response of the project on soils, plants, hydrology and native animal species.

RESPONSE: The project area is primarily located in the Government Mountain Allotment with a small portion of it in the Moritz Lake Allotment (see Chapter 3 – Rangeland Vegetation and Range Management). At this time, removing the project area from currently authorized grazing allotments would not meet the purpose and need for action and would therefore be outside the scope of this analysis and decision. Future projects pertaining to range management in the area will consider these suggestions.

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